Der 18. Internationale Sauna Kongress

Stuttgart, Deutschland

XVIII International Sauna Congress

25-27 October 2022

Messe Stuttgart

Hosting:
Deutscher Sauna-Bund e.V.
Meisenstraße 83
33607 Bielefeld

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– Deutscher Sauna-Bund e.V.–
Gastgeber des Internationalen Sauna Kongresses
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The Deutscher Sauna-Bund is the world's largest association for health-oriented sauna bathing. In accordance with its statutes, it pursues the goal of spreading the idea of sauna bathing in Germany, educating people about the effects and construction of saunas and advising all members of the association and supporting them with its range of services.

Sauna bathing has had a firm place in the German spa industry for decades. The Deutscher Sauna-Bund is the leading association for the sauna industry and for the leisure sectors that also offer sauna services. Competence in the sauna and related forms of bathing is based on the many years of experience of experts in medicine and technical equipment.

Der Deutsche Sauna-Bund e.V. ist der weltweit größte Verband für das gesundheitsorientierte Saunabaden. Er verfolgt satzungsgemäß das Ziel, die Idee des Saunabadens in Deutschland zu verbreiten, über die Wirkungen und den Bau der Sauna aufzuklären sowie alle Mitglieder des Verbandes zu beraten und mit seinem Leistungsangebot zu unterstützen.

Das Saunabaden hat seit Jahrzehnten einen festen Platz in der deutschen Bäderbranche. Der Deutsche Sauna-Bund ist der führende Verband des Saunabadewesens und für die Freizeitbranchen, die auch Saunaleistungen anbieten. Die Kompetenz für die Sauna und verwandter Badeformen basiert auf der langjährigen Erfahrung von Experten aus Medizin und Technik.

Members
Mitglieder

The members are public sauna and bathing businesses (municipal or privately run), hotels and guesthouses with sauna facilities, sauna manufacturers and commercial companies, planning offices, start-ups and people interested in saunas.

Die Mitglieder sind öffentliche Sauna- und Badebetriebe (kommunal oder privat betrieben), Hotels und Pensionen mit Saunalandschaft, Saunahersteller und Handelsunternehmen, Planungsbüros, Existenzgründer und Saunainteressierte.

Objectives and tasks
Ziele und Aufgaben

The objectives of the Deutscher Sauna-Bund are to introduce sauna bathing to broad sections of the population on a scientifically sound basis for the general promotion of health, to support sauna construction through expert advice and the development of guidelines, and to promote the establishment and management of good saunas.

This means:

- ✓ Further development of the scientific basis of sauna bathing
- ✓ Safeguarding the performance, competitiveness and reputation of the industry
- ✓ Promoting fair competition in the industry
- ✓ Support in business management issues to maintain a good sauna culture
- ✓ Promoting innovation in technical equipment and organisation
- ✓ Education and training of employees in the sauna industry
- ✓ Intensive public relations work to publicise the sauna industry
- ✓ For the quality assurance of services and products in the industry, we offer:
  - Guidelines and recommendations for public sauna systems
  - Design guidelines for sauna manufacturers Classification systems for public saunas
  - Quality assessment of aufguss products
  - Staff training
  - Development of guidelines for the construction and operation of saunas

Ziele des Sauna-Bundes sind, das Saunabaden auf wissenschaftlich fundierter Basis zur allgemeinen Gesundheitsförderung breiten Bevölkerungsschichten nahe zu bringen, den Saunabau durch fachliche Beratung und die Erarbeitung von Richtlinien zu unterstützen und die Einrichtung und Führung guter Saunabäder zu fördern.

Dies bedeutet:

- ✓ Weiterentwicklung der wissenschaftlichen Grundlagen des Saunabadens
- ✓ Sicherung von Leistung, Wettbewerbsfähigkeit und Ansehen der Branche
- ✓ Förderung des fairen Wettbewerbs in der Branche
- ✓ Unterstützung in betriebswirtschaftlichen Fragen zur Pflege einer guten Saunakultur
- ✓ Förderung von Innovationen in Technik und Organisation
- ✓ Aus- und Weiterbildung von Fachpersonal für öffentliche Saunabäder
- ✓ Intensive Öffentlichkeitsarbeit zur Bekanntmachung der Saunabranche
- ✓ Zur Qualitätssicherung von Dienstleistungen und Produkten der Branche bieten wir an:
  - Richtlinien und Empfehlungen für öffentliche Saunaanlagen
  - Konstruktionsrichtlinien für Saunahersteller Klassifizierungssysteme für öffentliche Saunen
  - Qualitätsbeurteilung von Aufgussprodukten
  - MitarbeiterInnenschulung
  - Erarbeitung von Richtlinien für den Saunabau und den Betrieb von Saunabädern

Organisation and staff
Organisation und Mitarbeitende

The executive committee shall perform the work required to fulfil the tasks set out in the statutes in an honorary capacity. The executive committee is supported by full-time staff in its own office. The employees are qualified and motivated. They see their task as a service provider to create a good sauna culture for the health and recreation of the interested population.

Das Präsidium nimmt die zur Erfüllung der satzungsgemäßen Aufgaben erforderlichen Arbeiten ehrenamtlich wahr. Unterstützt wird das Präsidium von hauptamtlichen, qualifizierten und motivierten Mitarbeitenden in der eigenen Geschäftsstelle. Sie sehen ihre Aufgabe als Dienstleister zur Schaffung und Erhalt einer guten Saunakultur, die zur Gesundheit und Erholung der Sauna interessierten Bevölkerung beiträgt.

The future
Die Zukunft

Due to the increasing health awareness of the population, sauna bathing will help determine the future bathing culture in Central Europe. As an association, we want to further expand our leading position and secure the successful development of the sauna industry in the long term.

Das Saunabaden wird aufgrund des zunehmenden Gesundheitsbewusstseins der Bevölkerung die zukünftige Badekultur in Mitteleuropa mitbestimmen. Als Verband wollen wir unsere führende Position weiter ausbauen und die erfolgreiche Entwicklung der Saunabranche langfristig sichern.

1.1. Greeting from the President of the Deutscher Sauna-Bund e.V. - Prof. Dr Carsten Sonnenberg - Grußwort vom Präsidenten des Deutschen Sauna-Bundes e.V. - Prof. Dr. Carsten Sonnenberg –

The 18th International Sauna Congress was held in Stuttgart from 25 to 27 October 2022. This congress is held every four years in different countries. Germany hosted the event for the fifth time, the last time being in Aachen in 1999. We were able to welcome around 200 guests from 16 countries to the presentations. Normally there would have been more. But the very difficult economic and political times have also massively affected the congress. In order to give all sauna enthusiasts, the opportunity to participate, the presentations during the congress were broadcast live on the Internet for the first time in history.

The congress was opened very atmospherically by the Finnish Ambassador Ms Anne Sipiläinen together with the Uusikuu band. This was followed by top-class contributions from international keynote speakers on the topics of sauna and health, sauna and wellness trends as well as ecological and technical issues. The latter topic in particular met with great interest among sauna and wellness operators against the background of sustainability. In conjunction with interbad, the world's largest trade fair for saunas, which took place at the same time, an unprecedented ambience was created that led to a lively international exchange among the participants. The result was a combination that optimally linked the areas of science, technology and trends in the sauna, bath and wellness industry.

The congress was rounded off by an event programme. For example, excursions to sauna and wellness facilities could be booked. The highlight was of course the interbad party in the style of a funfair, where over 1,000 people celebrated together.

Thanks are due to all those who actively contributed to the realisation of the International Sauna Congress during this difficult time, especially to the organisational team around Rolf A. Pieper and Jennifer Jaekel, the sponsors, above all the main sponsor Klafs from Schwäbisch Hall, and the International Sauna Association. A very special thank you goes to Messe Stuttgart, which has always supported us in terms of organisation and personnel and has been there for us with advice and assistance.

I wish all sauna enthusiasts a good time and many aufgusses until the next congress, where the sauna world will meet in person or digitally.

Der 18. Internationale Saunakongress fand vom 25. bis 27. Oktober 2022 in Stuttgart statt. Dieser Kongress wird alle vier Jahre in verschiedenen Ländern abgehalten. Deutschland war zum fünften Mal Ausrichter, zuletzt Mal 1999 in Aachen. Zu den Vorträgen konnten wir rund 200 Gäste aus 16 Nationen begrüßen. Normalerweise wären es mehr gewesen. Doch die wirtschaftlich und politisch sehr schwierigen Zeiten haben auch den Kongress massiv beeinträchtigt. Um dennoch allen SaunafreundInnen die Möglichkeit zur Teilnahme zu geben, wurden die Kongressvorträge erstmals in der Geschichte live im Internet übertragen.

Eröffnet wurde der Kongress sehr stimmungsvoll von der finnischen Botschafterin Frau Anne Sipiläinen zusammen mit der Band Uusikuu. Es folgten hochkarätige Beiträge von internationalen Referenten zu den Themen Sauna und Gesundheit, Sauna- und Wellnesstrends sowie ökologische und technische Fragen. Gerade letzteres Thema stieß bei Sauna- und Wellnessbetreibern vor dem Hintergrund der Nachhaltigkeit auf großes Interesse. In Verbindung mit der zeitgleich stattfindenden Interbad, der weltgrößten Fachmesse für Saunen, wurde ein noch nie dagewesenes Ambiente geschaffen, das zu einem regen internationalen Austausch unter den Teilnehmern führte. So entstand eine Kombination, die die Bereiche Wissenschaft, Technik und Trends in der Sauna-, Bad- und Wellnessbranche optimal miteinander verknüpfte.

Abgerundet wurde der Kongress durch ein Eventprogramm. So konnten beispielsweise Exkursionen zu Sauna- und Wellnessanlagen gebucht werden. Der Höhepunkt war natürlich die Interbad-Party im Stil einer Kirmes, bei der über 1.000 Menschen gemeinsam feierten.

Der Dank gilt allen, die in dieser schwierigen Zeit aktiv an der Durchführung des Internationalen Saunakongresses mitgewirkt haben, insbesondere dem Organisationsteam um Rolf-A. Pieper und Jennifer Jaekel, den Sponsoren, allen voran dem Hauptsponsor Klafs aus Schwäbisch Hall und der International Sauna Association. Ein ganz besonderer Dank geht an die Messe Stuttgart, die uns immer organisatorisch und personell unterstützt hat und mit Rat und Tat zur Seite stand.

Ich wünsche allen Saunafreunden eine gute Zeit und viele Aufgüsse bis zum nächsten Kongress, bei dem sich die Saunawelt persönlich oder digital treffen wird.

Prof. Dr. Carsten Sonnenberg

(Präsident des Deutschen Sauna-Bundes e.V.)

2. Die International Sauna Association

International Sauna Association (ISA)

The International Sauna Association (ISA) is an association of national and other sauna societies, organisations and private people. It was founded in 1958 with the office in Germany. After 20 years quite slow activities it was reborn in 1977 in Helsinki Finland and the office was agreed to be in Helsinki.

The founding members were Austria, Germany, Finland and Japan and they are continuously members. Besides those there are 20 other members including all the important sauna countries. The President has been all these years from Finland.

ISA and its members shall pursue the goal of publicizing the sauna and promoting its use on a global scale by rallying supporters of sauna activities in different countries.

This goal is served e.g. by acceptance of the Definition of Sauna recorded in Aachen, Germany 1999 as well as promoting the scientific studies of the sauna from e.g. such viewpoints as social history, folklore, medicine and technology. A particular emphasis is given to the collection and compilation in archives of the results of such scientific studies as well as other written material on sauna.

Die "International Sauna Association" (ISA) ist ein Zusammenschluss von nationalen Sauna-Gesellschaften und anderen Organisationen und Privatpersonen. Sie wurde 1958 mit einem Büro in Deutschland gegründet. Nach 20 Jahren geringer Aktivitäten wurde sie 1977 in Helsinki, Finnland, wieder ins Leben gerufen. Die Geschäftsstelle wurde in Helsinki eingerichtet.

Die Gründungsmitglieder waren Österreich, Deutschland, Finnland und Japan, die auch heute noch Mitglieder sind. Daneben gibt es 20 weitere Mitglieder, darunter alle Länder mit nennungswerter Saunaverbreitung. Der Präsident kam in all diesen Jahren aus Finnland.

Die ISA und ihre Mitglieder verfolgen das Ziel, die Sauna bekannt zu machen und ihre Nutzung weltweit zu fördern, indem sie Anhänger von Saunaaktivitäten in verschiedenen Ländern zusammenbringen.

Diesem Ziel dient z.B. die allgemeine Anerkennung der 1999 in Aachen, Deutschland formulierten Saunadefinition sowie die Förderung der wissenschaftlichen Erforschung der Sauna unter sozialgeschichtlichen, volkskundlichen, medizinischen und technischen Gesichtspunkten. Ein besonderer Schwerpunkt liegt auf der Sammlung und Archivierung der Ergebnisse solcher wissenschaftlichen Studien sowie anderen schriftlichen Materials über die Sauna.

The XVIII International Sauna Congress - a summary
Der XVIII. Internationale Sauna-Kongress – ein Resümee

The 18th International Sauna Congress was held in Stuttgart, the state capital of Baden-Württemberg, from 25 to 27 October. It continued a tradition of events dealing with the medical effects, economic and planning conditions, technological developments and the cultural aspects of sauna use since the 1950s.

The event is held every four years by the International Sauna Association based in Helsinki, which commissions a national association to organise each event. After the last congress in 2018 took place in the Swedish-Finnish border region around Happaranda/Tornio, the Deutscher Sauna-Bund is hosting the event in Germany for the fifth time.

Der 18. Internationale Sauna-Kongress wurde vom 25. bis 27. Oktober in der Baden-Württembergischen Landeshauptstadt Stuttgart veranstaltet. Er setzte eine Tradition von Veranstaltungen fort, die sich seit den 50er Jahren des 20. Jahrhunderts mit deren medizinischen Wirkungen, den wirtschaftlichen und planerischen Rahmenbedingungen, der technologischen Entwicklungen und den kulturellen Aspekten der Saunanutzung befasst.

Die Veranstaltung wird alle vier Jahre von der International Sauna Association mit Sitz in Helsinki durchgeführt, die jeweils einen nationalen Verband mit der Organisation beauftragt. Nachdem der letzte Kongress 2018 in der schwedisch-finnischen Grenzregion rund um Happaranda/Tornio stattfand, ist der Deutsche Sauna Bund zum fünften Mal Gastgeber der Veranstaltung in Deutschland.

Framework conditions
Die Rahmenbedingungen

The event was held in Stuttgart for the first time. It was particularly rewarding for visitors that the congress was held parallel to interbad. interbad is considered the largest sauna trade fair in the world. Furthermore, Stuttgart is a very well-known spa city with the second largest mineral water source in Europe. The framework conditions for the congress in Stuttgart were ideal.

The pandemic, transport and financial conditions were clearly less favourable for holding the congress. Thus, before the start of the congress, there was great uncertainty as to whether and with what possible restrictions the event could be held, such as mask and test obligations, limits on the number of participants or access regulations. It was also not clear for a long time whether the public sauna baths, which were intended for visits and events, would be open. These uncertainties also affected the interbad trade fair.

Transport concerns related to air and rail transport, with staff shortages and energy savings in Germany, as well as general infection control conditions in many countries.

Financially, the realisation of the congress was a risk for the Deutscher Sauna-Bund and its executive committee. The budget, already strained by the one-and-a-half-year pandemic-related revenue shortfall, could not be burdened again. All event ideas and event areas had to be economically successful. In addition, sponsor acquisition was difficult due to the overall economic situation and financial commitments from the International Sauna Association were not realised

Die Veranstaltung fand zum ersten Mal in Stuttgart statt. Für die Besucher war es besonders lohnend, dass der Kongress parallel zur interbad stattfand. Die interbad gilt als die größte Saunamesse der Welt. Darüber hinaus ist Stuttgart eine sehr bekannte Kurstadt mit dem zweitgrößten Mineralwasservorkommen in Europa. Die Rahmenbedingungen für den Kongress in Stuttgart waren ideal.

Deutlich weniger günstig für die Kongressdurchführung waren die pandemischen, die verkehrstechnischen und die finanziellen Rahmenbedingungen. So bestand vor Kongressbeginn große Unsicherheit, ob und mit welchen möglichen Einschränkungen wie Masken- und Testpflichten, Teilnehmerzahlbegrenzungen oder Zugangsregelungen die Veranstaltung durchgeführt werden könnte. Auch war lange nicht klar, ob die öffentlichen Saunabäder, die für Besichtigungen und Events vorgesehen waren, geöffnet seien. Diese Ungewissheiten betrafen auch die Messe interbad.

Verkehrstechnische Sorgen betrafen den Flug- und den Bahnverkehr mit der Personalknappheit und der energetischen Einsparungen in Deutschland sowie den allgemeinen Infektionsschutzbedingungen in vielen Ländern.

Finanziell war die Kongressdurchführung für den Deutschen Sauna-Bund und sein Präsidium ein Wagnis. Der ohnehin schon durch die eineinhalbjährigen pandemiebedingten Umsatzausfälle strapazierte Haushalt durfte nicht erneut belastet werden. Alle Veranstaltungsideen und Eventbereiche mussten wirtschaftlich erfolgreich sein. Außerdem war die Sponsorenakquisition aufgrund der gesamtwirtschaftlichen Situation schwierig und finanzielle Zusagen der internationalen Saunagesellschaft wurden nicht realisiert.

Thematic focus
Die thematische Ausrichtung

When the International Sauna Association took over the organisation of the congress, it was already proclaimed that the congress topics would correspond to the Central European sauna culture. As a result, sauna bathing in public baths was paramount.

Sauna bathing in Finland, which is bound to traditions and special types of construction such as the smoke sauna, had been presented in detail at the previous congress in Finland and Sweden and was not to be discussed again. Topics around the construction and operation of public sauna systems with current operational aspects of energy turnover were to dominate the congress in terms of content, also with regard to the interest of German participants. However, findings on the health effects of sauna bathing and the corresponding research situation were not to be dispensed with either. Thus, three topics were created with five lecturers each, a fourth topic on operating models of public sauna systems was cancelled when the programme was shortened due to the number of participants.

Schon bei der Übernahme der Kongressdurchführung von der Internationalen Saunagesellschaft wurde proklamiert, dass die Kongressthemen der mitteleuropäischen Saunakultur entsprechen würden. Das Saunabaden in öffentlichen Bädern stand demzufolge im Vordergrund.

Das an Traditionen und spezielle Bauarten wie z.B. der Rauchsauna gebundene Saunabaden in Finnland war auf dem Vorgängerkongress in Finnland und Schweden ausführlich dargestellt worden und sollte nicht erneut thematisiert werden. Themen rund um Bau und Betrieb öffentlicher Saunaanlagen mit aktuellen betrieblichen Aspekten des Energieumsatzes sollten auch im Hinblick auf das Interesse deutscher Teilnehmer den Kongress inhaltlich dominieren. Auf Erkenntnisse zu den gesundheitlichen Wirkungen des Saunabadens und zur entsprechenden Forschungslage sollte jedoch auch nicht verzichtet werden. So wurden drei Themenkreise mit jeweils fünf Dozenten erstellt, ein erarbeiteter vierter Themenkreis zu Betriebsmodellen öffentlicher Saunaanlagen wurde bei der teilnehmerbedingten Programmkürzung gestrichen.

Topics
Die Themenkreise

Topic I: More than sweating - sauna and health
Themenkreis I: Mehr als schwitzen – Sauna und Gesundheit

Topics on health and medical content are presented at all international sauna congresses. For example, the first International Sauna Congress in 1956 in Bielefeld dealt with several field reports from university clinics on therapeutic sauna bathing. The keynote speech "Dermatological aspects for sauna bathing and for the therapeutic use of the sauna" from the University of Freiburg/Br. was described as particularly impressive. Almost 60 years later there was a presentation in Helsinki on the same topic by the Dermatology Clinic of the University of Jena. It becomes clear that "sauna and health" have always been a much-discussed part of the congresses. In addition, such studies also have great significance for the spread of saunas in countries with a focus on public sauna bathing. Two renowned sauna scientists took stock of sauna studies in the first topic. The demand for more scientific research was clearly expressed by both. In addition, it was interesting to hear what is new about the human perception of temperature - a central aspect of sauna use. The contribution to the topic of "Sauna and Sport" was also part of a well-established study strand. Especially the reference to everyday life was an interesting approach.

Themenkreise zu gesundheitlichen und medizinischen Inhalten hat es auf allen internationalen Saunakongressen gegeben. So hat der erste Internationale Saunakongress 1956 in Bielefeld mehrere Erfahrungsberichte aus Universitätskliniken zum therapeutischen Saunabaden behandelt. Als besonders eindrucksvoll wurde der grundlegende Vortrag “Dermatologische Gesichtspunkte für das Saunabaden und für die therapeutische Anwendung der Sauna“ von der Universität Freiburg/Br. bezeichnet. Fast 60 Jahre später gab es einen Vortrag in Helsinki zum gleichen Thema von der Hautklinik der Universität Jena. Es wird deutlich, „Sauna und Gesundheit“ war schon immer ein vieldiskutierter Teil der Kongresse. Daneben haben solche Studien auch große Bedeutung für die Verbreitung der Sauna in Ländern mit dem Schwerpunkt des öffentlichen Saunabadens. Bestandsaufnahmen zu Saunastudien lieferten im Themenkreis I gleich zwei renommierte Saunawissenschaftler. Die Forderung nach mehr wissenschaftlicher Forschung sprachen beide deutlich aus. Darüber hinaus war es interessant, was es Neues zum menschlichen Temperaturempfinden - einem zentralen Aspekt der Saunaanwendung - zu berichten gibt. Der Beitrag zum Thema „Sauna und Sport“ reihte sich ebenfalls in einen bewährten Studienstrang ein. Besonders der Alltagsbezug war dabei ein interessanter Ansatz.

Topic II: Quo vadis, sauna?
Themenkreis II: Quo Vadis Sauna?

When sauna bathing slowly became popular in Germany immediately after the Second World War, there was only the Finnish model. But it soon became apparent that, for infrastructural reasons, family sauna bathing could only be one option. Sauna bathing in public facilities became so popular that today more than 18 million people in Germany visit them. In the further development of public saunas, more and more sweat rooms were added to the bathing facilities: steam room, hot-air bath and the infrared heat cabin. The sauna was challenged in terms of health effects. In the baths, but also in medical circles, the question was asked: Quo vadis, sauna? A further developmental variant was the aufguss about 20 years ago. It created a motif complement of the sauna practice from wellness application to experience orientation. "Quo vadis, sauna?" is what sauna guests and operators asked themselves again.

Als das Saunabaden unmittelbar nach dem zweiten Weltkrieg in Deutschland langsam bekannt wurde, gab es nur das finnische Vorbild. Doch schon bald zeigte sich, dass aus infrastrukturellen Gründen das familiäre Saunabaden nur eine Möglichkeit der Baddurchführung sein konnte. Das Saunabaden in öffentlichen Einrichtungen wurde so populär, dass heute mehr als 18 Millionen Menschen in Deutschland sie besuchen. In der weiteren Entwicklung der öffentlichen Saunabäder kamen in der Badeinrichtung immer mehr Schwitzräume hinzu: Dampfraum, Warmluftbad und die Infrarotwärmekabine. Die Sauna wurde bezüglich der gesundheitlichen Wirkungen herausgefordert. In den Bädern, aber auch in ärztlichen Kreisen wurde die Frage gestellt: Quo Vadis Sauna? Eine weitere Entwicklungsvariante brachte dann vor etwa 20 Jahren der Aufguss. Er schaffte eine Motivergänzung der Saunapraxis von der Wellnessanwendung hin zur Erlebnisorientierung. „Quo Vadis Sauna?“ fragten sich erneut Saunagäste und Betreiber.

Topic III: Ecological and technical challenges for sauna construction and operation
Themenkreis III: Ökologische und technische Herausforderungen für den Saunabau und –betrieb

Ecology, energy optimisation and savings are buzzwords that could often be found in the media last autumn. The topic is not new and was even in the events of the Deutscher Sauna-Bund. What is new, however, is the enormous financial and time pressure with which they are discussed and their connection to the existence of the association. Sauna facilities and baths are affected by this in a special way. In this situation information and expert discussions are essential. The presentations were oriented towards this and offered practical considerations.

Ökologie, Energieoptimierung und Einsparungen sind Schlagworte, die sich im Herbst letzten Jahres oft in den Medien finden ließen. Auch in den Veranstaltungen des Deutschen Sauna-Bundes war und ist die Thematisierung nicht neu. Neu sind aber der enorme finanzielle und zeitliche Druck mit der sie diskutiert werden und ihre Verbindung zur Existenz der Gesellschaft. Saunabetriebe und Bäder sind davon in besonderer Weise betroffen. In dieser Situation sind Informationen und Fachgespräche unerlässlich. Daran orientierten sich die Referate und boten praxisrelevante Überlegungen.

The participants
Die Teilnehmerinnen und Teilnehmer

The approximately 200 participants came from 16 countries. In addition, interested parties also took advantage of the online transmissions of the presentations and keynote speeches.

Overall, the organisational team of the congress and the executive committee of the sauna association had expected significantly more participants. The unsettling conditions described above, but also the participation fees for the topics and the excursions which were initially set too high, affected the willingness to participate in the congress.

Once again, the very different interest in the topics and sauna practice in the sauna world and the International Sauna Association became clear. The content orientation of the congress on commercial and public sauna bathing and the forms of operation met with no interest, e.g., in Finland. For example, the International Sauna Association, based in Helsinki, was only able to attract four participants in its home country to attend the congress. Sauna bathing in Finland is oriented towards private and country-specific conditions. At the 17th International Sauna Congress in Sweden/Finland it was the other way round. The contributions requested for the 17th International Sauna Congress, which were oriented more towards Finnish traditions, barely induced Central European sauna enthusiasts to travel to Lapland. The executive committee of the International Sauna Association is called upon here to build bridges for comprehensive understanding and joint success.

Die etwa 200 Teilnehmerinnen und Teilnehmer kamen aus 16 Ländern. Darüber hinaus nahmen Interessenten auch die Online-Übertragungen der Vorträge wahr.

Insgesamt waren das Organisationsteam des Kongresses und das Präsidium des Sauna-Bundes von deutlich mehr Teilnehmern ausgegangen. Die beschriebenen verunsichernden Rahmenbedingungen, aber ebenfalls die zunächst zu hohen Teilnahmegebühren für die Themenkreise und die Exkursionen beeinträchtigten die Bereitschaft, am Kongress teilzunehmen.

Dabei wurde auch erneut das sehr unterschiedliche Interesse an den Themenkreisen und der Saunapraxis in der Saunawelt und der Internationalen Saunagesellschaft deutlich. Die inhaltliche Ausrichtung des Kongresses am gewerblichen und öffentlichen Saunabaden und den Betriebsformen traf auf kein Interesse z.B. in Finnland. So konnte die Internationale Saunagesellschaft mit Sitz in Helsinki nur vier Teilnehmer in ihrem Stammland für eine Kongressteilnahme gewinnen. Saunabaden in Finnland orientiert sich eben an privaten und landestypischen Gegebenheiten. Beim 17. Internationalen Saunakongress in Schweden/Finnland war es umgekehrt. Die dort aufgerufenen, mehr an finnische Traditionen ausgerichteten Beiträge veranlassten kaum mitteleuropäische Saunainteressenten zur Reise nach Lappland. Das Präsidium der Internationalen Saunagesellschaft ist hier aufgerufen, für ein umfassendes Verständnis und gemeinsame Erfolge Brücken zu bauen.

The sponsors
Die Sponsoren

The organisational team was able to win over the world's leading sauna and wellness manufacturer Klafs from Schwäbisch Hall as the main sponsor. The company thus continued the congress-supporting tradition as Klafs was already the main sponsor at the XII International Sauna Congress in Aachen in 1999.

Other sponsors included the aufguss specialists Aromen - Natural Wellness from Belgium and the traditional German company Spitzner from Ettlingen, as well as Ziegra Eismaschinen and Nazar Wellness. Further support was also provided by Landesmesse Stuttgart, which celebrated the fifteenth anniversary of the new trade fair centre during the congress, Stuttgarter Bäder with the Mineralbad Berg sauna facility, the International Sauna Association with its 19 partner associations and Deutsch-Finnische Gesellschaft, which finished its sauna water marathon from Tampere in Finland at the opening of the congress.

This content presentation is intended to document the congress contributions for further use and to acknowledge the work of the speakers.

Das Organisationsteam konnte als Hauptsponsor, den weltweit führenden Sauna- und Wellnesshersteller Klafs aus Schwäbisch Hall gewinnen. Das Unternehmen setzte damit die Kongress unterstützende Tradition fort, denn bereits 1999 beim XII Internationalen Saunakongress in Aachen war Klafs Hauptsponsor.

Als weitere Sponsoren traten die Aufgussespezialisten Aromen – Natural Wellness aus Belgien und das deutsche Traditionsunternehmen Spitzner aus Ettlingen sowie Ziegra Eismaschinen und Nazar Wellness auf. Weitere Unterstützung gewährten zudem die Landesmesse Stuttgart, die in den Kongresstagen ihr fünfzehnjähriges Bestehen des neuen Messegeländes feiern konnte, die Stuttgarter Bäder mit der Saunaanlage Mineralbad Berg, die Internationale Saunagesellschaft mit Ihren 19 Partnerverbänden und die Deutsch-Finnische Gesellschaft, die ihren Saunawassermarathon von Tampere in Finnland bei der Kongresseröffnung beendete.

Diese inhaltliche Darstellung soll die Kongressbeiträge für eine weitere Nutzung dokumentieren und die Arbeit der Referenten würdigen.

Bielefeld, im Januar 2023
Rolf-A. Pieper
Congress leader | Kongressleiter

3.1. CONGRESS PROGRAM
XVIII International Sauna Congress

25.–27. October 2022 | Messe Stuttgart

Tuesday 25. Oct. 2022 Room: C1.1.2 08.30-09.00 a.m.

Moderation

Rolf-A. Pieper *Congress Director*
Jennifer Schönbohm *Congress Manager*

Band

Uusikuu – finish Tango Band

Greetings and Opening Words

Finish Ambassador:	Anne Sipiläinen
President of host Deutscher Sauna-Bund e. V.:	Prof. Dr. Carsten Sonnenberg
President of International Sauna Association:	Risto Elomaa
Finnland Institut:	Mikko Fitze
and	
Finnisch-Deutsche Gesellschaft:	Mari Koskula

Official Aufguss-Ritual to Start the Talks of the International Sauna Congress 2022
From finish Ambassador Anne Sipiläinen

Band

Uusikuu – finish Tango Band

Introduction to the Sauna Aid Association

Presentation and Video — Mikkel Aaland

Tuesday 25. Oct. 2022 C1.1.2 09.30-11.30 a.m.

Guided Tour Messe Stuttgart

Walk through the Hall 2 with professionals of the Messe Stuttgart. Afterwards a little typical finish snack is given by the Deutsch-Finnische Gesellschaft.

Moderation:
Rolf-A. Pieper

Moderation:
Jennifer Schönbohm

Topic 1: MORE THAN SWEATING - SAUNA AND HEALTH

Timeslots

Basics and evidence of effectiveness of hardening by sauna **01.00-01.30 p.m.**

PD Dr. med. Rainer Brenke:
Former Medical Director Department of Naturopathy, Germany
Hardening" is probably the most widely accepted medical effect of regular sauna use. In this article, the most important physiological effects and pathways of action are presented. At the same time, an attempt is made to answer the question of how reliable hardening effects are in epidemiological terms. Despite extensive publications in recent years, there is still a clear need for research in this field.

Lessons learned from 50 years of sauna studies – Time for standardized sauna research protocols! **01.30-02.00 p.m.**

Prof. Dr. Hans Hägglund:
University of Uppsala, Sweden
In the paper, studies of sauna research between 1969 and 2018 are analyzed qualitatively. The importance of standardized study designs is highlighted for better evaluation and comparability.

Heat sensation and heat acclimation – how does it work and what is it good for? **02.00-02.30 p.m.**

Prof. Dr. Jan Siemens:
Dean of Research of the Faculty of Medicine Heidelberg, Germany
Temperature detection is an important sensory modality serving multiple functions. Not only is it necessary to perceive the outside world, but our internal homeostasis requires requires precise internal body temperature detection and regulation. Last year's Nobel prize for Physiology or Medicine was awarded for the identification and characterization of the molecular underpinnings that allow us to perceive hot and cold. In this presentation I will first introduce peripheral temperature sensors of the TRP ion channel family and in the 2nd part I will describe very recent findings that can explain how long-term heat exposure triggers heat tolerance.

The effects of regular exercise and sauna bathing on cardiovascular function **02.30-03.00 p.m.**

Earric Lee:
Faculty of Sport and Health Sciences, University of Jyväskylä, Finland
The talk is about a multi-arm randomized controlled trial to investigate the cardiovascular adaptations to regular Finnish sauna bathing when used in conjunction with exercise in the general population.

Free Bathing at Mineralbad Berg (Full Congress Ticket) 05.00-07.30 p.m.

Mineralbad Berg is one of the three thermal baths in Stuttgart, the city with the largest mineral water deposit in Western Europe. The bath of Mineralbad Berg can be used by guests with total congress ticket in bathing clothes. The bath uses water from state-approved medicinal water springs. In the outdoor pool, this carbonated medicinal water can be enjoyed in its natural state, as there is no need for chlorination due to the high concentration of the springs. An unforgettable moment after a sauna session, as the approx. 20 °C cold

healing water tingles on the skin heated by the sauna. This is unique and only possible in Stuttgart. In addition to the swimming pool area, you can also enjoy the sauna area at Mineralbad Berg. This is traditionally operated separately for the sexes. The sweating itself is done naked, as is customary in Germany.
Whether gentle sweating in the warm air room with aroma at approx. 60-65 °C or a hot aufguss in the approx. 90-95 °C warm aufguss sauna: sauna hearts will beatfaster.

Wednesday 26. Oct. 2022 C1.1.2 09.00-11.30 a.m.

Moderation:
Rolf-A. Pieper

Moderation:
Jennifer Schönbohm

Topic 2: QUO VADIS SAUNA?

Timeslots

Design and Wellness Trends Shaping the North American Sauna Market Opportunity **09.00-09.30 a.m.**
Don Genders:
CEO & Founder of Design for Leisure, Austin in Texas
In this presentation, Don Genders, CEO of Design for Leisure and chair of GWI's Hydrothermal Initiative, will explore the current sauna landscape in North America and beyond, highlighting opportunities and global trends while addressing the challenges and misconceptions faced in a region where sauna bathing is not part of the cultural norm.

The target group-oriented head concept of Therme Wien and the Therme Laa **SILENT SPA** **09.30-10.00 a.m.**
Georg Wiesauer:
Management Therme and Silent Spa of the Therme Laa – Hotel & Silent Spa, Austria
The importance of target group-oriented sauna concepts is explained using the example of Therme Wien and SILENT SPA. Insights are given into the conceptions of Europe's largest city spa and the premium day spa "SILENT SPA" in Austria.

How online sauna community boost enthusiasm for saunas in Japan? **10.00-10.30 a.m.**
Yu Suzuki:
CEO of Sauna Ikitai, Japan

Sauna is now fascinating more and more Japanese people, especially young people and women. The key driver of this growing enthusiasm for sauna is online sauna community. By introducing SAUNA IKITAI the talk describes how online sauna community boost enthusiasm for sauna. SAUNA IKITAI is one of the largest sauna search and social media service in Japan. Monthly 1.4 million sauna lovers are gathering.

Healthy Neighborhoods – Inner-City Bathhouses as New Social Meeting Places **10.30-11.00 a.m.**

René Pier:

Freelance interior architect & member of the state board of AKBW Architektenkammer Baden-Württemberg, Germany

The presentation addresses the coming global trend to revitalize inner-city bathhouses. This could be a challenge for investors and municipalities. Health care could be brought closer to the people with bathhouses in inner city locations and be part of the transformation of inner cities.

Wednesday 26. Oct. 2022 C1.1.2 01.00-03.30 p.m.

Moderation:
Rolf-A. Pieper

Moderation:
Jennifer Schönbohm

Topic 3: ECOLOGICAL AND TECHNICAL CHALLENGES FOR SAUNA CONSTRUCTION AND OPERATION

Timeslots

Optimized energetic sauna and bath operation the focus of the current global resources **01.00-01.30 p.m. in**

Hans-Helmut Schaper:

Managing Director and Partner Planungsgruppe VA, Germany

How can sauna and bathing facilities still be operated in the future under the currently changed conditions of energy supply? Possibilities are shown to realize the sauna and bathing operation without the consumption of fossil resources and thus climate-neutral. Decentralized solutions are in the foreground.

The positioning of wellness – hotel and retreats **01.30-02.00 p.m.**

Hans Dolman:

Quality Wellness Resorts; Founder and major shareholder, Netherlands

Hans Dolman will introduce you to the concept of Quality Wellness Resorts. This includes the sustainable economy as well as the management of the employees. Various sustainable measures will be presented, with which the wellness resorts fulfill their social responsibility.

Energy efficiency in public sauna baths **02.00-2.30 p.m.**

Markus Gäbele:

Dipl.-Ing., authorized signatory and head of development and design at KLAFS, Germany

Economic efficiency and safety play an important role in the operation of public sauna facilities. Savings potentials are often not recognized and realized. In the case of saunas and steam baths, there are several opportunities. These possibilities of sustainable energy management will be shown in the lecture. The importance of uncomplicated maintenance will be pointed out.

Green Sauna: Solar Wellness all Over the World **2.30-3.00 p.m.**

Dr.-Ing. Micha Schäfer:

Institute for Building Energetics, Thermotechnology and Energy Storage (IGTE), Germany

A growing number of people is interested in low-carbon sauna technology. Moreover, many places in the world have no access to electricity, gas and wood. A collaboration between Stuttgart University and the startup company Thermal Energy Storage Systems (THESS) have created world's first solar sauna and develop concepts for commercializing this innovative technology. The presentation will explain the technical principles of the technology and discuss its potential for a carbon-free solar sauna world of the future.

HALF-DAY TRIP: STUTTGART BATHS EXCURSION – FROM FASHIONABLE HEALTH RESORTS TO MUNICIPAL BATHS AS PART OF PUBLIC SERVICES

Guided by René Pier:
Freelance interior architect & member of the state board of AKBW Architektenkammer Baden-Württemberg, Germany
Travel with interior designer René Pier through the city with the largest mineral water deposit in Western Europe. Learn more about the city, its history and about the many special features.
Starting at the booth of the Deutsche Sauna-Bund, you will then visit a bath with sauna as part of the "Hannibal" residential complex from the 1970s. From there, you have a perfect view of the Swabian Alb and immerse yourself in a time when community shaped architecture.
The next stop leads into the current architectural language with the F3 adventure pool and shows a sauna as part of the local supply for the citizens of the city. Outdoor pool and indoor pool combined in one place with a strong focus on low-threshold accessible relaxation.
The Kurhaus in Bad Cannstatt then offers the best opportunity to take a coffee break with regional cake specialties. At this historic site, two short lectures will tell you how it all began 250 million years ago and what the future holds for saunas.
The tour ends in downtown Stuttgart, with a short tour of the city center followed by the opportunity for dinner.

Ticket booking as well as the condition of participation you find here:
https://ticketing-isc-2022.com/registration

Interpreter:
Claudia Schaffert
Graduate conference interpreter (PGDip)

3.2. Location of the Congress

Messe Stuttgart: A location that gets you ahead.

The Stuttgart region is one of the strongest economies in Europe. Stuttgart is its center and holds a top position as a research location nationwide. Large companies and research institutions form a unique industrial cluster here and network in 25 technology fields from automotive to environmental technology. In the middle of it all - and in the middle of the market: Messe Stuttgart is a location that combines an inviting atmosphere with a wide range of advantages for the partners of f-cell, from the hotels on the campus to the transport connections.

- Directly at the airport: Only 300 m from the terminal to the trade fair entrance.
- Directly on the highway: Connection to the A8 and several federal highways.
- Direct parking: 15,000 parking spaces around the exhibition center.
- Directly to the city: Only 30 min. by S-Bahn to the main train station and Stuttgart city center.
- New in 2022: U-Bahn stops at Messe Ost and Messe West.
- Smooth logistics: Truck access to every hall and ground-level halls with spacious logistics areas.
- Optimal infrastructure: One of the best technically equipped trade fair centers in Europe.

Die Region Stuttgart ist eine der stärksten Wirtschaftsregionen in Europa. Stuttgart ist ihr Zentrum und nimmt als Forschungsstandort bundesweit eine Spitzenposition ein. Große Unternehmen und Forschungseinrichtungen bilden hier ein einzigartiges Industriecluster und vernetzen sich in 25 Technologiefeldern von Automotive bis Umwelttechnik. Mittendrin statt nur dabei - und mitten im Markt: Die Messe Stuttgart ist ein Standort, der eine einladende Atmosphäre mit einer Vielzahl von Vorteilen für die Partner verbindet, von den Hotels auf dem Campus bis zur Verkehrsanbindung.

- Direkt am Flughafen: Nur 300 m vom Terminal bis zum Messeeingang.
- Unmittelbar an der Autobahn: Anschluss an die A8 und mehrere Bundesautobahnen.
- Direktes Parken: 15.000 Parkplätze rund um das Messegelände.
- Direkt in die Stadt: Nur 30 Minuten mit der S-Bahn zum Hauptbahnhof und in die Stuttgarter Innenstadt.
- Neu ab 2022: U-Bahn-Haltestellen Messe Ost und Messe West.
- Reibungslose Logistik: LKW-Zufahrt zu jeder Halle und ebenerdige Hallen mit großzügigen Logistikflächen.
- Optimale Infrastruktur: Eines der technisch am besten ausgestatteten Messegelände in Europa.

3.3. Participants Statistics

We are glad to announce that all in all there have been 202 participants in presence and online.

Wir freuen uns, Ihnen mitteilen zu können, dass es insgesamt 202 Teilnehmer in Präsenz und online gab.

3.3.1 Countries

Through out the whole congress there were people from a sum of 16 different countries. The given numbers are not set, because some of the visitors have chosen to not say from which country they were and some came just on the

starting day of the congress and bought a ticket right away. Because of privacy policies as well as the basic data protection regulation this information will not be forced from the open cases.

Während des gesamten Kongresses waren Besuchende aus insgesamt 16 verschiedenen Ländern anwesend. Die angegebenen Zahlen sind nicht festgelegt, da einige der Gäste sich entschieden haben, nicht anzugeben, aus welchem Land sie kamen. Außerdem kamen einige Besuchende erst am ersten Tag des Kongresses und kauften ein Ticket vor Ort. Aus Gründen des Datenschutzes und der Datenschutzgrundverordnung werden diese Informationen nicht weiter erläutert.

Countries	**Amount of People**
Sweden	5
Norway	2
Belgium	2
United Kingdom	5
Estonia	2
Finland	4
Germany	46
Romania	4
Austria	1
United States of America	2
Canada	4
Australia	1
Poland	1
Netherlands	1
Yugoslavia	2
Slovakia	1

3.3.2. Gender

From the 202 participants there has been tagged as Male: 129; and as female: 63. 10 people did not indicate gender.

Von den 202 Teilnehmern deklarierten sich 129 als männlich und 63 als weiblich deklariert. 10 Personen gaben kein Geschlecht an.

3.3.3. Private/Company

Taken together all information that are open to share, we have in common 91 people were send by companies. 17 people said there were coming as a private person and 86 did not give an answer.

91 Personen besuchten den Kongress mit geschäftlichem Hintergrund und 17 Besuchende waren privat interessiert. 86 Personen gaben keine Angaben an.

Here is a list of some of the companies:

Aromen Aromatherapy
Bora Sauna
Carolus Therme
Design for Leisure
Deutsch Finnische Gesellschaft
Farris Bad
Finnland Institut
Frankfurter Bäder
Harvia
Japanese Spa Association
KLAFS
Ministry of Foreign Affairs of Finland
Nana Textiles
Nautilla
Nazar Wellness
Pirts Spirit
Planteam Ruhr
Sauna IKITAI
Spadom
Spitzner
The Lost Faucet Sauna House
Ziegra

3.4. Speakers

All thanks go to our inspiring experts and speakers. Following you will find all speakers and a short vita about them. The order of the enumerations is based on the order of the talks held.

Unser Dank geht an unsere inspirierenden Experten und Referenten. Nachfolgend finden Sie alle Referenten und eine kurze Vita über sie. Die Reihenfolge der Aufzählungen richtet sich nach der Reihenfolge der gehaltenen Vorträge.

PD DR. MED. RAINER BRENKE

Former Deputy Director of the Clinic & Poliklinik for Phys. Med. and Rehabilitation of the Charité, Berlin as well as former Chief Physician and Medical Director in Hospital Departments for Naturopathic Medicine

PD Dr. med Rainer Brenke received his training as an internist and specialist for physical medicine at the Berlin Charité, among others under Prof. Conradi. He worked here for many years, most recently as Deputy Director of the Clinic and Polyclinic for Physical Medicine and Rehabilitation. From 1994 to 2011 he worked as chief physician and medical director in hospital departments for naturopathy in Lower Bavaria and Rhineland-Palatinate. He has been scientifically involved with the topic of “sauna” since the 1970s.

PROF. DR. JAN SIEMENS

Vice Dean for Research, Dean of Research at the Heidelberg Medical Faculty

Prof. Dr. Jan Siemens currently works as the Dean of Research at the Faculty of Medicine at the University of Heidelberg, where he holds the Current Professorship in the Department of Pharmacology. He is also group leader of the Molecular Medicine Partnership Unit (EMBL, Heidelberg).

PROF.DR. HANS HÄGGLUND

MD. PhD. Professor at University of Uppsala, Sweden

Hans Hägglund is a “Sauna Doctor” at the Swedish Sauna Academy, in 2018 he was one of the leading people in the organizing committee for the XVII International Sauna Congress in Haparanda/Tornio, Sweden. His book “The Sauna Book – Hot Facts about Sauna and Health” was published in Swedish in 2020.

EARRIC LEE

Doctoral Researcher, Exercise Medicine Faculty of Sport and Health Sciences, University of Jyväskylä

Doctor researcher Earric Lee works at the University of Jyväskylä at the Faculty of Sport and Health Sciences. He has published several times on sauna effects on the cardiovascular system.

HANS DOLMAN

Quality Wellness Resorts Netherlands; Founder and major shareholder

Hans Dolman is the founder and main shareholder of Quality Wellness Resorts with four spas and two hotels in the Netherlands. In addition, he is very active in the promotion of European Aufguss competitions and is a member of the board of Aufguss-WM e.V.

YU SUZUKI

Managing Director Skyspa Yokohama

Yu Suzuki is the CEO of SAUNA IKITAI, the largest sauna search and social media service in Japan. Suzuki gained a master degree in computer science at the University of Tokyo in 2015 and worked at Rakuten as a data scientist for 4 years. Mr. Suzuki started Sauna Ikitai in 2017 and hac committed to it as CEO, engineer and data scientist.

GEORG WIESAUER

Operations management Silent Spa and Treatments at Therme Laa

Georg Wiesauer completed the management trainee program of VAMED Vitaliy World after his tourism management studies at the FH IMC Krems. After working as Assistant Spa Manager at TAUERN SPA Kaprun, Mr. Wiesauer took over the divisional management of Therme, Silent Spa and Treatments at Therme Laa in 2019.

Don Genders

CEO & Founder of Design for Leisure, Austin in Texas

Don Genders is CEO and founder of Design for Leisure (DFL). The company is a developer of award- winning hydrothermal areas that combine the health benefits of ancient bathing practices with modern design, materials and technology. DFL's clients include companies such as Canyon Ranch, Caesars Palace, Disney, Four Seasons, Six Senses and many more.

RENÉ PIER

Freelance interior architect & member of the state board of AKBW Architektenkammer Baden-Württemberg

In 2000, René Pier founded the office SCHIENBEIN+PIER. Parallel to his work in the office, René Pier has been teaching as a lecturer at the HFT (University of Applied Sciences) in Stuttgart in the master's program IMIAD (International Master of Interior-Architectural Design) since 2016. On the regional board of the bdia (Association of German Interior Architects) and through his extensive lecturing activities, René Pier is networked worldwide in the industry. In 2020, he was a member of the ECIA (European Council of Interior Architects) workgroup for the amendment of the Charter for the Education of Interior Architects in Europe.

MARKUS GÄBELE

Dipl.-Ing., authorized signatory and head of development and design for sauna as well as spa, at KLAFS Schwäbisch Hall

Markus Gäbele, Dipl.-Ing. is an authorized signatory at KLAFS, where he is responsible for sauna and spa technology as head of development and design. His many years of experience in the construction of high-quality sauna and professional wellness facilities make him a specialist in energy and cost efficiency. He is a member of several standards committees. He has lectured several times at events organized by the Deutscher Sauna-Bund.

DR. MICHA SCHÄFER

University of Stuttgart Institute for Building Energetics, Thermotechnology and Energy Storage (IGTE) Chair for Energy StorageTitle: Green Sauna: Solar Wellness all Over the World; Germany

Since 2014 at the University of Stuttgart, at that time as a research assistant, Dr. Schäfer continued his career with his doctorate on "Modeling and Simulation of Low-Pressure Adsorbers for Thermal Energy Storage". Since then, he became head of a research group and lecturer for various thermodynamics (TD) lectures. Since 2017, the collaborator in the development of a climate-neutral sauna (concept study, design, demonstration).

HANS-HELMUT SCHAPER

Managing Director of Planungsgruppe-VA GmbH, Hanover Chairman of the DGfdB Technical Committee

In addition to his entrepreneurial tasks as managing director and shareholder, Hans-Helmut Schaper has been active in the field of swimming pools & wellness throughout Germany for more than three decades. Not least through his association memberships, such as Chairman of the Technical Committee in the DGfdB as well as Deputy Chairman of the Working Group AK Energy and Resources at the German Society for the Bath Industry (DGfdB), as an expert for pool technology, wellness and drinking water hygiene.

3.5. Transcripts of the Talks

For various reasons, the following congress papers cannot be published:

- "The positioning of wellness - hotel and retreats", Hans Dolman
- “Design and Wellness Trends Shaping the North American Sauna Market Opportunity", Don Genders

Aus unterschiedlichen Gründen können folgende Kongressbeiträge nicht veröffentlicht werden:
- „The positioning of wellness – hotel and retreats“, Hans Dolman
- „Design and Wellness Trends Shaping the North American Sauna Market Opportunity“, Don Genders

PD Dr. Rainer Brenke: Resilience throughout Sauna

What is backed up?

One of the most important health effects of regular sauna use is generally considered to be "toughening up" (resilience).

What is "resilience” - Attempt for a modern definition

Resilience represents the consequence of repeated conscious or unconscious exposure of the human being to natural stimuli with a general increase in resistance to disease.

This would also mean that, ideally, a resilienced person not only suffers less from flu-like infections, but is generally more stable in health.

However, this article is predominantly concerned with what is most commonly associated with "hardening." The probable lower susceptibility to viral infections through regular sauna use.

Possible "natural stimuli" are:

- Warmth (heat)
- Cold (or the alternating stimulus of the sauna)
- Climate, including a reasonable amount of sun exposure, depending on skin type.
- Moderately dosed endurance sports (no competitive sports)

Proof of effectiveness of resilience: a problem

The very question of how to prove the effectiveness of hardening measures is fraught with problems. The reasons for this are manifold, e.g.

- In most cases, hardening measures are applied to (still) healthy persons.
- How to prove that the healthy person becomes even healthier?
- Laboratory methods are used to detect diseases
- The psyche plays a major role in influenza infections and the subjectively perceived health stability.

EPIDEMIOLOGICAL DATA

Before thinking about the effectiveness of hardening measures such as the sauna, it is useful to answer the question: How certain is an effectiveness proven at all? Is it certain that regular sauna use makes you less susceptible to flu-like infections? Only if this question can be answered unambiguously positively, it makes nevertheless sense to examine effect ways of a possible hardening more exactly. Since there are now thousands of studies on the sauna, only a few can be singled out, but the author of this article considers them typical for the respective question.

Sauna bathing - subjective health consequences - older surveys

- In surveys of different groups in the 1950s and 1960s, 27% of sauna users reported being "completely free" and 56% "almost free" of infections
- In the 1957 "Asian flu", a pandemic, only 5% of sauna users were ill, but 16 - 47% of employees of different companies were ill
- Frequency and duration of incapacity for work in the case of flu infections are generally reported to be lower among sauna users

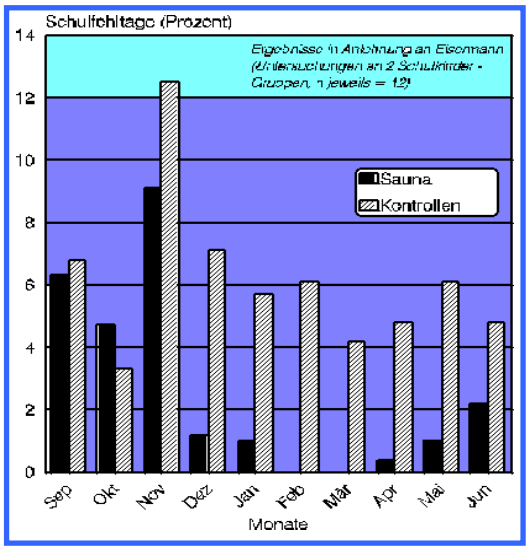
Fundamental work of Ernst & co-workers 1990: Hardening by sauna and cold casts

The frequency of influenza infections was investigated in 3 experimental groups (25 subjects each)

- *Control group*
- *sauna*
- *Cold showers*

After about 1/4 year, the effect of hardening measures became statistically noticeable. Both the sauna subjects and those who regularly performed cold showers were less likely to contract influenza infections. The problem was: no strict randomization (assignment to groups voluntary, not random), small number of cases. Nevertheless, this study is still considered one of the basic works.

One of the older Berlin studies: days missed from school with regular sauna attendance (1985)



Study of 2-classes, half of which visit the sauna once a week with parental consent, the other half serving as a control group (Eisermann, 1985). The height of the columns indicates the number of days missed from school due to infections.

A clear effect of the sauna was detectable after just a few months. The number of days absent from school due to infections temporarily dropped to zero in the sauna group. After the end of regular sauna use, the number of infections increased again within about 1/4 year in the sense of a "washout effect".

One problem here was also that no strictly random assignment to the groups could take place, since parental consent was a prerequisite for participation.

Large Finnish study 2022: Does regular sauna use affect the risk of developing pneumonia?

Pneumonia is a possible and potentially life-threatening complication of influenza or a more severe flu-like infection, but it can also occur from other causes. Kunutsor, Jae, and Laukkanen published a large study involving 2264 participants in 2022. In this study, 528 suffered pneumonia over a period of 26.6 years. Frequent sauna use was associated with lower inflammation in laboratory parameters (high sensitivity CRP) and lower pneumonia incidence, so the more often one went to the sauna during the week, the lower the risk of contracting pneumonia. (Kunutsor, SK; Jae, SY; Laukkanen,
JA 2022)

Sauna and COVID 19

A currently much discussed topic is whether sauna can protect against corona disease. First of all, the good news: Corona viruses are very sensitive to heat. Therefore, there is hardly any risk of infection in the sauna cabin itself. However, changing rooms, relaxation rooms, the cooling procedures and the catering are problematic.... So there is no getting around hygiene concepts similar to those in restaurants or swimming pools.

Presumably, regular sauna visits can contribute to prevention. However, as with influenza or flu-like infections, we do not believe that sauna use is advisable in the case of an acute infection. This has to do both with the risk to other sauna guests and with a risk to oneself in the case of undetected heart involvement or a temporary weakening of certain immunological mechanisms through the sauna stimulus.

MECHANISMS OF RESILIENCE THROUGH SAUNA

1. Mechanism: influencing the heat balance and blood circulation

Direct thermal damage to viruses

A very simple mechanism that possibly prevents the onset of a viral infection: Hot breathing air can conceivably cause direct damage to viruses in the nasopharynx.

Sauna core temperature

Sauna is not an artificial fever, but a hyperthermia! In **fever**, as is known, the set point of the core temperature is increased, which is why the body initially produces heat, which is noticeable by freezing, possibly chills. In this phase heat supply e.g. by hot tea, warm blankets, warm foot baths or hot water bottle - not by the sauna, which is contraindicated with fever! No cold calf compresses in this fever phase. These only when sweating (fever drop is supported).

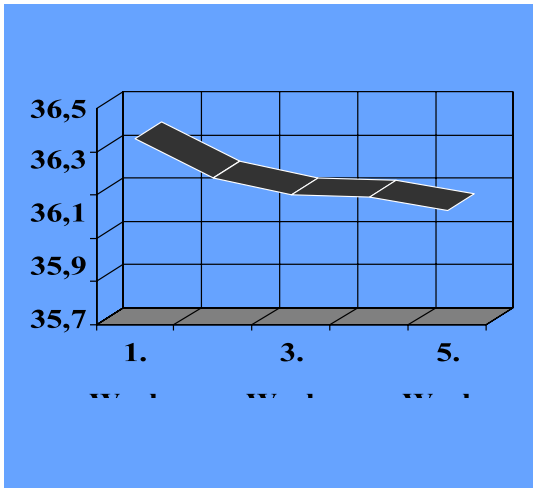
Hyperthermia e.g. in the sauna: The set point of the core temperature is "normal", the heat is imposed from the outside, because the thermoregulation is overstrained. Therefore, from the beginning, there is an attempt of the body to get rid of the heat, which is noticeable by sweating.

Fever and hyperthermia are therefore not identical in their effects. The sauna is not an "artificial fever"!

The expansion of the body core under sauna conditions is the most important thermo-regulatory effect. Acute and cardiovascular effects are associated with it. There is a vasodilatation of the skin vessels by the heat, the "vascular play" is exercised by the alternating stimulus of heat and cold.

A medium and long-term significant effect is the **adjustment of sweat secretion in the sauna.** Significant adaptations are already found within 4 weeks. This seems to essentially affect sweating under heat; there is no evidence for increased "vegetative" sweating (e.g., during excitement). Sauna can also be a good preparation for a planned stay in warm climates.

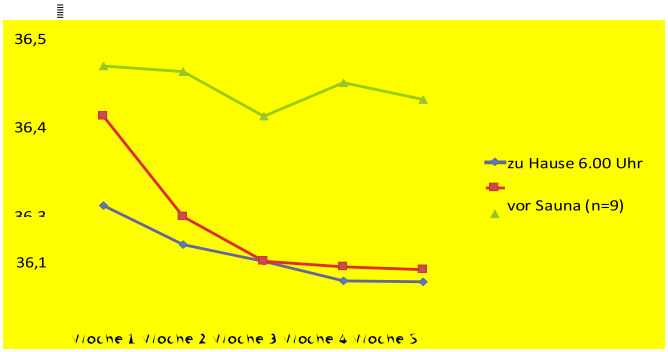
Decrease in core temperature due to a sauna series



Behavior of sublingual temperature (measured under the tongue before sauna, degrees C) as a measure of core temperature during a 5-week sauna series (mean values of 9 subjects).

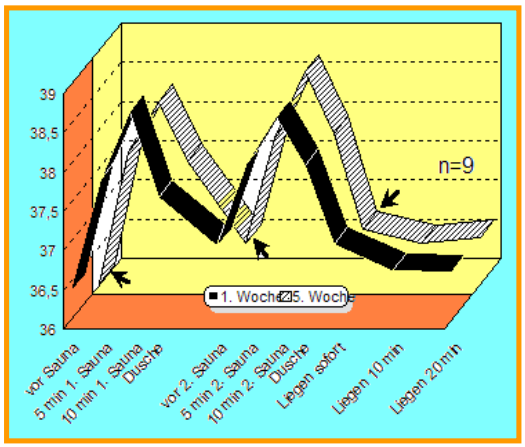
Importance of an expectation: core body temperature at home and before sauna

Investigation of 9 healthy male subjects aged 23-70 years (mean: 43.4 years) who visited the sauna 1 to 2 times a week in the afternoon.



Apparently, the anticipation before the sauna already leads to thermoregulatory changes - the drop in core body temperature is greater immediately before the sauna than at home. This speaks for a sauna procedure that is as constant as possible, i.e. also the observance of rituals.

Faster return of the temperature increased in the sauna to the initial values



Better thermoregulation and thus better sweating lead to a faster return of the elevated core temperature to baseline values after adaptation (back curve, hatched)

Possible significance of lowering the core temperature

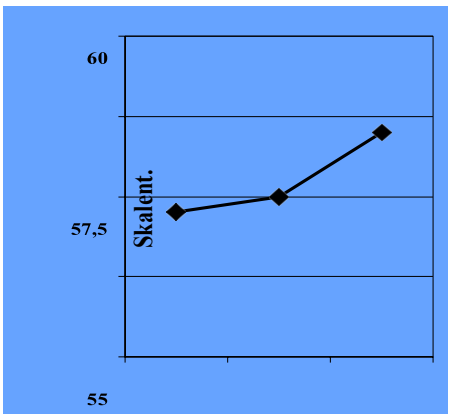
Thesis: By lowering the core temperature at baseline values over the long term, DNA damage and thus possibly e.g. cancer can be reduced. The thermolability that creates "disorder" in the cells could be reduced by lowering the core temperature.

Higher life expectancy?

If computer simulations by the Max Planck Institute of Biochemistry in Munich are to be believed, lowering the core temperature would result in a calculable increase in life expectancy.

- Experience has shown that thermal stimulation series can reduce the core temperature by around 0.50 C.
- This would result in an increase in life expectancy of around 5 years.
- If thermal adjustments were started in middle age, there would still remain 2 to 3 years.

Increase in skin temperature due to a sauna series



Temperature of the skin temperature measured at the fingertips independently of the sauna over the course of a series of 10 sauna baths (according to Hoffmann, n=40). For technical reasons, the temperature is given in "scale parts.

The increase from "before sauna" (i.e. before the start of the sauna series) to "10th sauna" is statistically significant. An increase in skin temperature and thus better skin circulation also reflexively means better mucosal circulation - important for defense.

Further meaning of warm "acra": Warm feet accelerate falling asleep

In addition to the reflex connection of the skin circulation on the acras with the mucous membranes in the

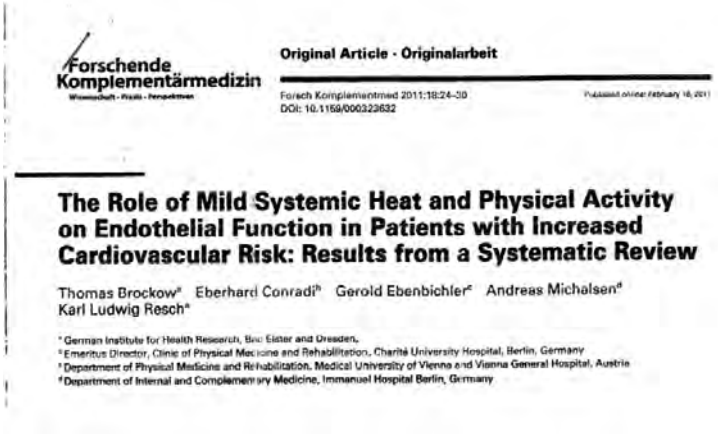
nasopharynx or the lower abdomen, there is also another aspect

with regard to maintaining health through hands or feet with good blood circulation: with warm feet, one falls asleep in bed significantly faster in the evening than with cold ones. A study from 1999 showed that the time it took to fall asleep with cold feet averaged 25 minutes, while with warm feet it averaged only 10 minutes (K. Kräuchi et al. 1999).

Larger blood vessels also become measurably wider (80s)

- After 3 months, increase in mean functional vascular cross-section by 22% - basis for blood pressure reduction.
- After 3 years by another 10%
- After 5 years increase by a total of 40% compared to "before sauna". (Winterfeld et al.)

Cause of dilatation: improvement of endothelial cell function (2011).



Forschende Komplementärmedizin

Original Article · Originalarbeit

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The Role of Mild Systemic Heat and Physical Activity on Endothelial Function in Patients with Increased Cardiovascular Risk: Results from a Systematic Review

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Evidence according to a meta-analysis already in 2011 (Brockow, Conradi et al. 2011).

WAON therapy and cardiac perfusion (2013)

Not only the skin circulation improves by overheating measures, but apparently also the heart circulation. This was examined e.g. also under the influence of an infrared cabin in Japan (WAON therapy). 16 of 24 patients used an infrared heat cabin of 60 degrees for 15 minutes daily followed by 30 minutes of rest, the remaining 8 patients served as a comparison group.

At baseline and after 3 weeks, nuclear medicine myocardial perfusion scintigraphy was performed. In the infrared-treated group, cardiac perfusion improved significantly, which was attributed to improved endothelial cell function of the blood vessels in the heart.

Sauna - thermal adjustments at a glance

In summary, the thermoregulatory adjustments associated with regular sauna use can be summarized as follows:

- *Temperature increase and improved blood flow regulation at the skin (especially the acras) and the mucous*

membranes

- *Trend to lowered core temperature (in connection with the first point: changed core/skin relation)*
- *Faster return of increased core temperature to initial values after thermal stress*
- *Increase of sweat secretion in sauna*

2. Mechanism: stabilization of the autonomic nervous system

Vegetative nervous system: sauna and vegetative cardiac nerve tone

The heart rate influenced by the sympathetic nervous system and the vagus and the sinus arrhythmia mediated only by the vagus (heart rate variability) were determined in 10 sauna users over the course of 9 weeks. Only the decrease in heart rate is significant, i.e., sympathetic tone decreases.

Regular sauna use thus lowers the influence of the stressor component of the autonomic nervous system (sympathetic tone). Regular sauna use thus primarily lowers the sympathetic tone, but a previously pathologically lowered vagotone can also be raised (Conradi et al. 1983).

Sauna: Substance P in blood plasma (1986)

Subjects studied: 28 sauna users, 9 comparison subjects.

Substance P is increased in sauna users.

Put simply, high titers of substance P are very likely to be associated with lower susceptibility to stress and thus higher vegetative stability.

3. Mechanism: "Strengthening the immune system"

Sauna and white blood cells („Leukocytes“):

Slight increase in the number after sauna. However, the number says little about the activity. The effect is probably non-specific and can be observed with many stimuli.

Mobility of white blood cells increases with rising temperature Temperature

Nahas et al., 1971

As the temperature rises, the white blood cells become more mobile and thus strengthen their defense function.

„Killer-Cells“ and Sauna

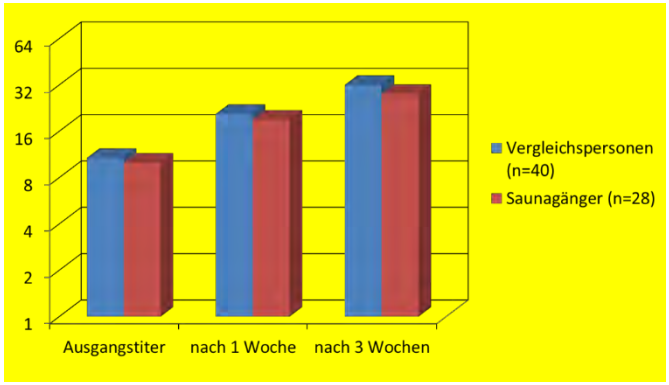
- Number of killer cells in blood and their stimulability increases by sauna
- (Gastl et al.)
- The so-called "natural killer cells" are part of the natural immunity and non-specific defense. After sauna their number and stimulability is increased immediately and in the long term

Sauna: activity of another subgroup of white blood cells ("granulocytes").

Own investigations of the "granulocyte function”. At least with unaccustomed at least 2 days drop of granulocyte activity.

Partial mechanisms of the defence can also be directly inhibited by sauna.

Sauna and interferon (long-term effect)



Significant increase of the interferon titer in the blood only with long-term, regular sauna use.

Sauna - Local defense in the mouth ("immunoglobulin A" in saliva)

- IgA plays an important role as the first immune barrier
- An observed increase after sauna indicates stimulation of local defense mechanisms

Comparable in content: Stimulation of ciliary activity - the activity of the ciliated epithelium increases ("mucociliary clearance").

Studies on 22 persons.

Sacharin test - shortened time to the appearance of a sweet taste of a sweetener tablet placed in the turbinate after sauna.

This is an indication of an increased activity of the "ciliated epithelium", i.e. an improved "cleansing function" at the mucous membranes (Rysánková 1988).

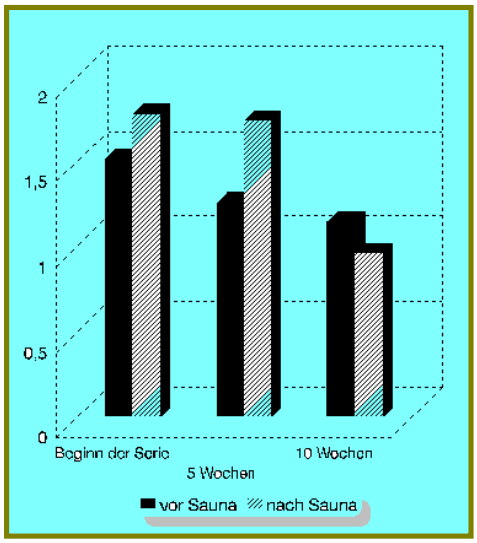
Sauna and specific immunity

Titer progression (geometric mean) after influenza vaccination in comparative subjects and regular sauna users.

Sauna probably has no influence on specific antibody production.

4. Mechanism: Better management of free radicals

Acute and medium-term effect of sauna on radical metabolism.



Parameter: Malondialdehyde = MDA in µmol/l Immediate increase in free radical load Cause: Presumably cold stimulus.

Adjustments over time: sauna lowers the organism's free radical load in the medium or long term. (according to Conradi, Brenke, Kästner et al. 1994).

Sauna and influence on inflammation and pneumonia risk

Already cited large Finn. study from 2022 (Kunutsor, Jae, Laukkanen 2022) with 2264 participants: Frequent sauna use was associated with fewer pneumonias and lower inflammation (high-sensitivity CRP).

MECHANISMS OF HARDENING – SUMMARY

Better blood circulation of skin and mucous membranes (alternating stimulus!)

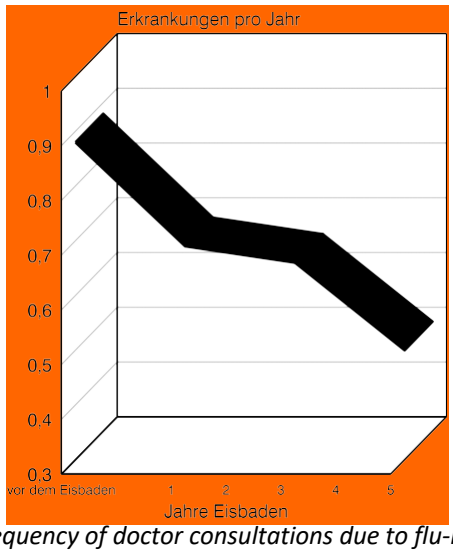
- Vegetative stabilization
- Stimulation of non-specific defense processes
- Better management of free radicals
- Reduction of inflammation

But: Sauna is most likely good for prevention, but with an acute infection you do not belong in the sauna.

Why are cold stimuli after sauna part of resilience?

- Faster normalization of skin and core temperatures
- The risk of circulatory dysregulation is reduced
- Cold stimuli represent a therapeutic measure for varicose veins
- Brief cold applications exercise vascular play both after heat and when used alone ("reactive hyperemia")
- Improvements in acral blood flow regulation not with exclusive heat applications
- Cold stimuli cause desirable vegetative changes
- Biochemical adaptations (strengthening of antioxidant protective systems, i.e. better coping with free radicals)

Cold stimuli alone also cause resilience - extreme example: ice bathing Health. Consequences of ice bathing are: Reduced number of visits to the doctor.



The frequency of doctor consultations due to flu-like infections is halved within a few years when ice bathing.

Ice bathing: Adaptation of acral blood flow regulation (winter)

Testing of the acral rewarming response on an index finger cooled with ice water in winter at cold ambient temperature: only the cold-adapted shows rewarming after additional cold stimulus in a cold environment.

HOW OFTEN SHOULD YOU GO TO THE SAUNA TO ACHIEVE DESIRED ADJUSTMENTS?

Older experience values and recommendations on the frequency of sauna use

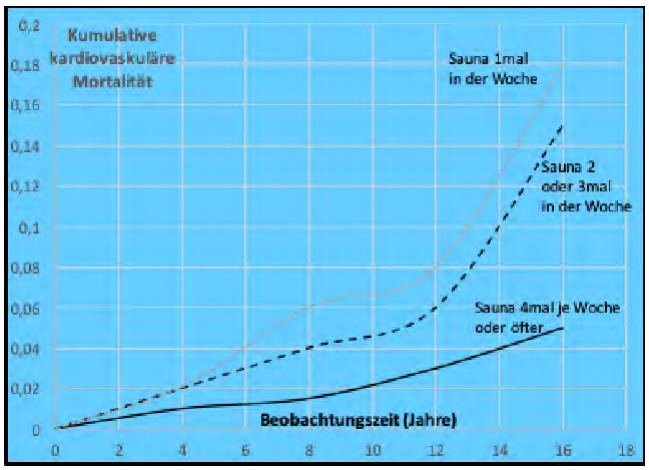
Ott 1948: recommendation once or twice a week

- Conradi, Brenke 1987: It takes more than 2 days to regulate laboratory changes
- Fritzsche 1996: "Few allow themselves a second sauna bath a week", exaggerations could lead to sleep disturbances and irritability
- Pieper 2006: "More important than the number of sauna sessions is the regularity" "quite a number of the health-relevant sauna effects need a refresher after eight to ten days"

The more frequent, the better?

Finnish studies from recent years (example: Laukkanen et al. 2018)

The best figures from the Finnish studies are probably available for cardiovascular diseases, but it is assumed that they can be generalized, especially since other diseases were also studied and yielded a comparable result.



Mortality from cardiovascular disease as a function of frequency of sauna use. Fig. modified after Laukkanen et al. 2018 (curves smoothed)

Finnish study already in 2015: the more frequent sauna, the less cardiac death?

There were already studies from 1994 - 2011 on 2315 middle-aged men. Important results were:

- The more frequent the sauna use, the fewer cardiovascular deaths or heart attacks occurred
- At 2-3 x / week the risk decreased by 23%, at 7 x / week by 48%

Evidence for the greater health effect of more frequent sauna use? Finn. Studies provide tremendous evidence, but no proof

Difficulties may arise in discussing the elaborate Finnish studies because of the following issues:

- Possibly fitter and healthier people go to the sauna more often
- Problem: Correlation does not prove causality
- In Finland, it is difficult to find a comparison group without a sauna
- No random assignment to groups with different frequency of sauna use
- In the cardiovascular study described above, there are some significant differences between groups (age, proportion of men, alcohol consumption, physical activity, diet, socioeconomic status, income, housing...)

So how often to the sauna?

- Older studies assume - as described - 1 or 2 times sauna per week (also a problem of practicability)
- New Finnish studies say that the more often, the better

However, this view can also be seen critically, the opinion of a Berlin mathematics professor on this:

"Your problem of cause-effect relationship between health and sauna is understandable and comparable to the question of which was there sooner: the chicken or the egg. I am afraid that this remains undecidable".

Advantages and disadvantages of older studies

Advantages:

- "True" longitudinal studies
- Comparison groups without sauna

Disadvantages:

- Small case numbers, usually short observation periods
- Often inconsistent randomization
- Sometimes outdated parameters
- Hardly any studies on dosing issues

Advantages and disadvantages of modern Finnish studies

Advantages:

- Large number of cases
- Limited statements about long-term effects
- Use of state-of-the-art parameters, including risk factors
- Recording of smaller subgroups

Disadvantages:

- Only limited randomization
- Groups only conditionally comparable
- Large lack of comparison groups without sauna
- Statements on cause and effect only possible to a limited extent

CONCLUSION

- Reducing the frequency and severity of flu-like infections through regular sauna use is very likely, but not conclusively established
- Much more is known about mechanisms that could contribute to hardening
- Future studies should also increasingly focus on epidemiological results. Dosing issues and differences between different forms of heat cabins need to be considered

Prof. Dr. Siemens: Heat sensation and heat acclimatization – how does it work and what is it good for?

Introduction:

How do we as human beings detect temperature? When you touch a hot plate or when you dive into a cold lake – how do we detect those temperatures? This has become fairly clear over the last decades and culminating in the Nobel Prize 2021 jointly awarded to Drs D. Julius and A. Patapoutian. They received the prize for identifying receptors, molecules in animal and human nerve fibers that allow us to detect temperature.

Back in the days Prof Dr Siemens and Mr Julius have worked together.

TRP Channels and the somatosensory system

In general, the somatosensory system works by detecting different temperatures and other outside world stimuli. Starting by explaining how the somatosensory system works we get closer to understand what a TRP ion channel is. Several TRP ion channels have been described to function in peripheral temperature (heat and cold) detection.

To detect outside world stimuli the nerve endings for example in our finger tips send information about heat and cold to our spinal cord and further to our brain. TRP channels translate the thermal signals into electric signals, which then are relayed along nerve fibers for processing by the brain.

To probe those electric signals, send by the cutaneous nerve endings, the group of David Julius and others have used plant products that mimic heat and cold signals. Heat was mimicked by the burning ingredient of the hot chili pepper (the molecule is called capsaicin) and cold by mint (the molecule is called menthol). The results pointed out the important role of the underlying molecular mechanisms of the extended family of so called TRP or Transient Receptor Potential Ion channels. These molecules are sitting in the membranes of our nerve fibers and open their pores to pass cationic ions thru the cell membrane –thereby initiating the electric signal which subsequently propagates to the brain.

The extended TRP channel family is involved in many physiological functions and not only relevant in sensory processes such as temperature detection (figure 1).

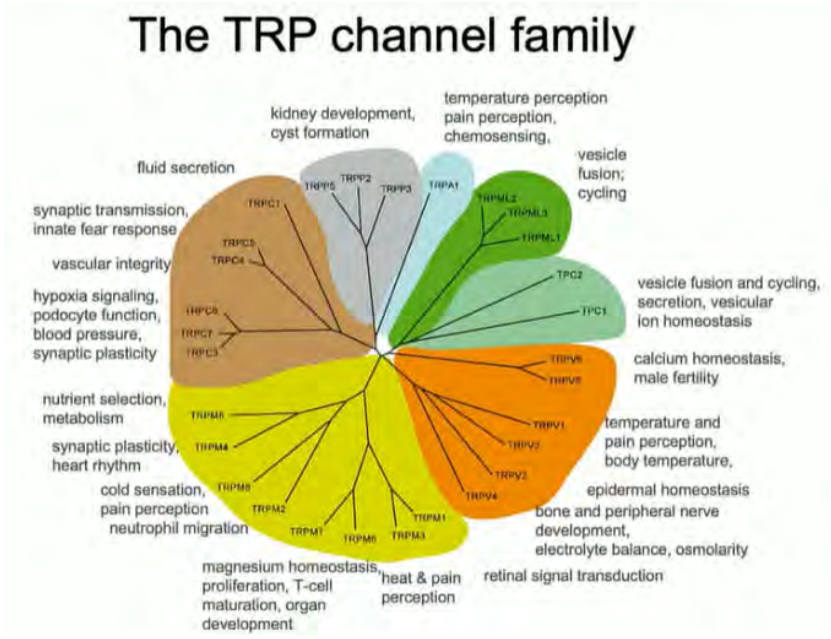


Figure 1: The TRP channel family (Prof. Thomas Gudermann, LMU Munich)

Heat-activated Ion Channel in Sensory Neurons – TRPV1

There is a landmark study from Caterina et al. from 1997 that shows the critical temperature of a little bit above 40 degrees when an ion channel all of a sudden opens up to depolarize the sensory neuron thereby sending a “heat” signal to the brain. They also found that this sensor is expressed in a subset of nerve cells, and not all of the cells of the sensory ganglion. These results suggested that cells are to some degree specialized – some are triggered by heat and some are not. This study was the basis for the group of D. Julius that eventually led to the Nobel Prize.

Cold-activated Ion Channel in Sensory Neurons – TRPM8

The cold and menthol receptor TRPM8 was cloned a few years later almost simultaneously b the Julius and Patapoutian groups. Those studies show that when you cool down cells, this ion channel opens at cold temperatures to trigger a signal that our brain interprets as the psychophysical sensation of cold.

Are TRPs physiologically relevant for temperature sensation?

To investigate this question Jan Siemens, at the time Postdoc in the Julius lab, did an experiment in which mice were employed that lacked the TRPM8 ion channel. The questions were: Can these mice still feel cold?

Experimental Settings:

To address this question Siemens and others created a cage where they implemented two different temperature floor plates. One side of the cage was prepared with a warm plate and the other with a cold one.

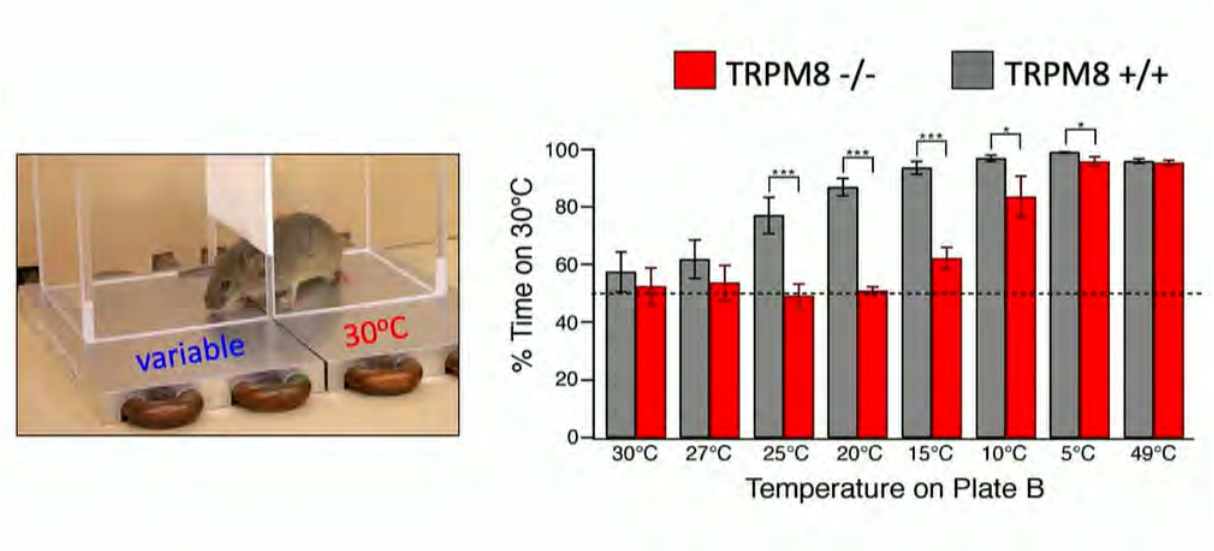


Figure 2: Experimental setting (left) and results (right) of wildtype and Trpm8 knock-out mice in a 2-place preference test, D. Batista & Siemens et al. 2007

Then they tested normal mice and the mice lacking the TRPM8 receptor in this experimental setting.

These experiments showed that Trpm8 knock-out mice were compromised in discriminating between cool to cold temperatures and a reference temperature of 30°C. (see figure 2).

Is the capsaicin receptor (TRPV1) responsible for detecting heat?

Turning the experiment around and repeating it with a heat stimulus. The scientist Muad Abd El Hay performed a similar experiment. He invented the “Temperature Chamber Preference Test”. In this setting mot only the temperature of the floor plates are controlled but the ambient of the entire room. The idea was to not only test the nerve endings the mouse uses to touch the ground but also the nerves of the whole body surface. A first result was that the TRPV1 channel alone does not seem to have the biggest impact of the mouse temperature preference. Because of that the researchers also deactivated/manipulated the TRPM2 channel who has also been implicated in

the detection of heat. Indeed, and in agreement with results from the group of Peter McNaughton in London, Trpm2 appears to be relevant from the discrimination of warm to hot temperatures.

Nevertheless, a combination of several ion channels has been found to be responsible for the detection of the full spectrum of heat.

What beneficial effects could long-term warm/heat exposure have on human beings?
Heat acclimation

The Siemens group is currently analyzing how heat acclimation —long-term exposure to warm temperatures— allows the central thermoregulatory region in the brain of laboratory mice to adapt in order to prime peripheral organs to better cope and tolerate heat. They found a discrete group of neurons in the hypothalamus that plastically transforms to become activated in the face of long-term heat stimuli. Continuing *in vivo* and *ex vivo* experiments, they further learned that this enhanced neuronal activity and temperature sensitivity is required and sufficient to drive heat tolerance in this animal model. Future work will tell whether such experiments can be translated to humans and whether regular sauna bathing triggers similar responses.

Prof. Dr. Hans Hägglund: Lessons learned from 50 years of sauna research
Time for standardized sauna research protocols

Today up to 50% of all cancer diseases and 80-90% of cardiovascular diseases are preventable. A healthy lifestyle is one important strategy to prevent diseases. The WHO have focused on four lifestyle factors; physical inactivity, tobacco use, alcohol use and unhealthy diets. Being physical active, not smoking, have a moderate alcohol intake and healthful diet and keeping a normal weigh increases life expectancy for women with 14 and men with 12 years according to a study published by Li et al in Circulation 2018. However, many lifestyle factors are less studied but might also be of importance to prevent diseases, one is heat, such as sauna bathing.

In EU one third of the population aged 15 and above lives with a chronic disease. But less than 3% of the total health care expenditure in EU goes to preventive care. It is therefore of importance to increase focus on prevention, both on the prioritized lifestyle factors, but also on other less studied factors. This presentation “Lessons learned from 50 years of sauna research” focused on the importance of standardize sauna study protocols.

A search in the PubMed database found 504 relevant papers on sauna research between 1969 and 2018. The number of published articles increased during the time period 2009-2018 as compared to previous decades, and more than doubled 2009-2018 vs 1999-2008. The studies have been performed in 43 different countries, with Finland, USA and Japan as the most active.

In total, only 24 out of 504 (5%) were randomized control studies and the median number of participants and controls was 17 (with a range of 1-23491) and twenty or less persons were included in more than half of the studies.

There were 267 (53%) studies in adults and only 13 (3%) included children (< 16 years). One hundred twenty-five (25%) of the studies included males and 33 (7%) females, both sexes were included in 88 (17%).

The most studied areas were cardiovascular diseases, evaluated in 93 (18%) studies, followed by endocrine disease or hormones in 45 (9%) and physiology in 44 (9%) studies. Regular sauna, defined as dry or humid, was used in 118 (23 %) and infrared-therapy in 58 (12%) of the studies.

In total 88 different study protocols were used (including number of sessions per day and/or week), usually not taken into account time spend in the sauna, breaks with or without showers, temperature or humidity. The total number of sauna sessions during the study period were 10 or less in 150 studies (30%) temperature was given in 43% and humidity in 22% of the studies.

In conclusion the sauna research activity during the time period 2009-2018 was increased compared to previous decades. Cardiovascular health was the most studied area. The gold standard method using randomized control studies was used in a minority of the studies. Regular sauna was more commonly used than the infra-red-light method. There were multiple study protocols used and the majority of the studies were small and focused on males and adults. The participants were exposed to a limited number of sauna sessions with short follow up.

It is of importance to develop standardized sauna protocols to further understand, evaluate and compare the possible mechanisms of sauna bathing on health. And it´s also important to attract researchers from different medical fields and to start up sauna labs in several countries and to work for the implementation of prescription of sauna, as a complement to prescription of physical activity and nature. To stimulate sauna research it is needed to increase the possibilities for funding.

Earric Lee: The effect of regular sauna bathing in conjunction with exercise on cardiovascular function: A multi-arm RCT

The proper conductance of a scientific experiment requires careful thought, detailed considerations, meticulous planning and above all else, ethical approval. Yes, that's right, ethical approval. Without these ingredients, any "evidence" we collect would be reduced to mere anecdotes that lack the integrity and rigor that is the essence of a replicable (repeatable) scientific process. We can all perform an intervention on ourselves and make claims about what it does/has done for us. But in order to make it more generalizable and valid for public discourse, an approach with more discern is needed. It is thus no exaggeration to say that the research planning process, with due diligence paid to the above-mentioned requisites easily took more than twice the time needed to actually conduct the study itself.

The research planning process could be summarized into three main points which forms a major part for the rationale of the study. Firstly, it was vital that we find ways to address some of the criticisms we received for our previous work in the field. This served two significant purposes, a) to show that we have understood, and taken into account the opinions of expert reviewers in the discipline, and b) to display the advancement of our scientific thought processes and progression of our skills in other related areas. For instance, most of the work we have done prior were criticized for being non-randomized, with a population that were often frequent sauna users who were non-naïve.

Secondly, we had to anticipate the challenges that might arise from the practical perspective. This was crucial because it had the potential to make or break the experiment. The difference being a research experiment with sufficient, and meaningful data that can withstand the scrutiny of the scientific method (more on that later), or just another number in the ever-expanding index of research "output" or "performance" measures. To ensure this, we conducted several pilot experiments prior to the actual trial. We piloted the exercise protocol, the sauna protocol and the exercise and sauna protocol, on both frequent and non-frequent sauna users. Following which we gathered feedback from all the participants to understand the processes that could be improved.

Lastly, we needed to recognize and minimize our biases and take a stringent, objective approach as we are both sauna enthusiasts and researchers. Amongst some of the more difficult questions we posed for ourselves was; if we were peer reviewers for this piece of work, what would we have liked to see, and what would the likely criticisms be, based on the choices made and the directions taken? We are well aware that perfection is always going to be a wild goose chase, but we did not need an excuse for mediocrity. Rather, we sought mindful justifications based on the limitations we had at the time. To that end, we also had to draw upon our collective expertise and identify what the field of heat therapy and sauna bathing needed, and how we could bridge the knowledge gap *in spite* of the limitations we had.

Zooming out from the deep, micro perspective, we moved into the broader macro view. We charted our project timelines and utilized Gantt charts for both the intervention and the data collection days. Participants are human beings just like us, which means that life and situations may get in the way during the intervention period. We had decided prior to the trial that in order to ensure sufficient statistical power, we would need an adherence rate of 95%. That means that participants in the trial could only miss one session out of 24, and they had to perform makeup sessions if they missed more sessions than that. Otherwise, we would need to abandon that particularly data set and consider the participant a dropped out. This point was made known to all the participants prior to the study, and was imposed to ensure the certainty of the research results. It would be challenging to account for participants who made 18/24 or 20/24 sessions, or in general, not having all the participants complete the same number of sessions, and we are well aware that our scientific peer reviewers will raise questions around the inter-subject comparability.

Let me give an example to illustrate this. Assume you walk the same distance and route to work every day. You use four different pairs of shoes for this purpose of walking, and you bought all four of them brand new, on the same

day. However, your shoes are worn randomly, you do not use the same pair every week or for the same number of days. It is thus not standardized. Now one of your shoes happen to fall apart. You can claim that it was not as durable or well-made as the other three pairs, given that you bought them at the same time. But it could also be that you used it more often, which likely resulted in that particular shoe being subjected to more stress than the others. Either way, to eliminate the possible influences and get as close as we can to the cause of your shoe being broken, we need standardization. Humans are complex organisms. As such, the lack of standardization at any level of the experiment would mean that the results may have been confounded; as there may be other factors at play that then needs to be accounted for. Yes, we could have done this after the experiment (post-hoc) statistically. But less is more, and we wanted to keep everything as simple as possible.

In terms of physically conducting the intervention and the trial itself, we owe much of its success to the 47 very special individuals who made it through this period together with us. Any human research requires human resource and volunteers, and they are as much a part of the team as the four exceptional young ladies that worked tirelessly during the data collection and training phases. Although on paper the intervention lasted eight weeks, which is technically true, the entire trial period was much longer. The initial recruitment and response phase was a month long, after which we had an information session where we made known to our respondents the level of commitment that would be needed for the study. We then had to perform individual health screenings on those that were able to commit to ensure that they are healthy, and met our inclusion and exclusion criteria. Because we specifically wanted to investigate people with cardiovascular risk factors, we needed to make sure that they did indeed have those risks. That process took two weeks, so we are now six weeks in, with no intervention conducted and still no results to show.

Next, we had to take the baseline measurements for the participants who were officially enrolled to the trial. This took another two weeks, in the wee hours of the morning from 0600 – 0930. So that is a total of eight weeks, plus the eight weeks needed for the intervention, and do not forget, we still need to take a post intervention measurement, which means another two weeks. So that brings the grand total to 18 weeks. This was projected ahead of time, so that we could calculate backwards to ensure that the trial would end *before* the third week of December, as we knew that was typically when people would go on their holidays and vacations. Now you must be thinking, “Okay, so what were the results of the trial?” In order to appreciate what the results actually mean, and what they tell us, we next have to know what the research question was, and understand a bit about the experimental approach taken to answer it. Our question was: “Does adding regular post-exercise sauna bathing result in more cardiovascular benefits compared to regular exercise alone?”

To answer this question, we conducted an 8-week multi-arm randomized controlled trial (RCT) to investigate if regular post-exercise sauna bathing would confer more benefits to cardiorespiratory fitness (CRF) and blood pressure (BP) compared to regular exercise alone. In plain English, that means we had our participants randomly assigned (to reduce biases) to three different groups in order to find out if this would be the case. We had an exercise only group (EXE), who exercised for 50 minutes, three times a week for eight weeks, and an exercise and sauna group (EXS) who had the same training as the EXE group, but went for 15 minutes of continuous sauna bathing after their exercise training session. We also had a sedentary control group (CON) that basically lived their regular lives but came to the lab to allow us to collect data on them before and after the intervention period. To further reduce biases and confounding factors, we promised the CON group that we would provide the same supervised exercise training as the EXE group *after* the trial. In exchange, we requested for them to adhere to their regular living habits as closely as possible during the trial period.

The training consisted of 20 minutes of resistance exercise performed in a circuit fashion, followed by 30 minutes of aerobic exercise on a stationary bike. We measured CRF, BP and other variables before and after the intervention so that we could find out what happens within the group (before vs after) and between the groups (e.g., EXE vs CON). Science is by no means an easy or simple undertaking, and because not all of us have undergone rigorous scientific training, those who desire more details, nuances and technicalities, can download the article from this link (https://journals.physiology.org/doi/full/10.1152/ajpregu.00076.2022) for your personal reading pleasure. So, what did we find? First and foremost, we found that our exercise intervention was able to induce beneficial adaptations, because our results showed that the EXE group had improved their CRF levels, and lowered their fat mass when

compared to the CON group, which is precisely the reason why we had a CON group in the first place, so we can ascertain that the EXE was indeed effective. This is a critical factor of the study and it will be elaborated a little further below. But secondly and perhaps more notably, the EXS group had greater increases in CRF and systolic BP when compared to the EXE group. Additionally, EXS was able to lower total cholesterol levels where EXE did not. But now let us go back quickly to the point made earlier about the CON group.

At first glance, it might seem unnecessary. And often to the untrained eye it does. Why is there a need for a CON group? Let's just compare between EXE and EXS and be done with it! What is the difference? Well, unfortunately it is not that simple. If we had indeed done that, and not have a CON group as a comparator, then we will not be able to make the statement that regular sauna bathing provided an "added benefit". Simply because, it *could have been* argued that the effects were due to unique individual responses; in that the participants in the EXS group responded more favorably to the exercise intervention itself, and it may not have been due to added benefit of regular sauna bathing *per se*. The present experimental design with the control group thus allowed us to demonstrate that the exercise intervention confers *X* effect, because otherwise it would have been null (as seen from the results of the CON group) but exercise and sauna bathing provided *X* + *Y* effect. The *Y* effect being attributable to sauna bathing.

These results are understandably very exciting for the entire field of heat therapy, and particularly sauna bathing related research, as it is the first registered RCT that was conducted, with findings that are published in English. However, we are only beginning to scratch the surface with this article, as several fundamental questions remain. For example, Would twice a week of sauna bathing with the same amount of exercise have the same effect? To quote a reviewer of the article, what about 35 minutes of exercise and 15 minutes of sauna bathing? How will that compare to just 50 minutes of regular exercise? These questions need to be framed in its proper context as well, given that there are many outcome variables that can be looked at. From a cardiovascular health perspective, it is important to capture measurable and quantifiable data, as these "hard numbers" are what would be needed to convince the appropriate healthcare authorities and policymakers.

As a community and as a field of study, we have yet to establish this with an adequate degree of certainty. No amount of anecdotal evidence will suffice, and it is a challenge that the field of heat therapy, and especially sauna bathing faces. I have been told numerous times that a lot of these questions have already been answered by early German researchers, which is great for those that speak or understand German. If that is indeed the case, then I would like to take this opportunity to implore any German-speaking enthusiast reading this to get in touch with Deutscher Sauna-Bund (https://sauna-bund.de) or the International Sauna Association (https://saunainternational.net/) and translate some of the earlier works to English so that we all can benefit from this knowledge. However, it is my responsibility as a researcher, and a scientist to point out that just like with any other aspect of life, levels, and standards exist. There are studies that meet the rigors of the scientific method, which includes accuracy, reliability, reproducibility, and validity. And there are others that do not. Just because a research article was put in print or published, does not necessarily mean that it has automatically met the criterion of well-produced science. Plenty of books get published in print every year. Many of them are poorly written, and not all of them are worth the time.

While many of the research articles published earlier may be great for businesses and convincing the average person to take up sauna bathing as a form of positive lifestyle modification, they may not be the most suitable for the purposes of driving change at the public health level, where stronger evidence is required. For instance, the correlations and associations that are shown by epidemiological, prospective cohort, and retrospective studies alone, are rarely sufficient for the advocacy of change or modifications of guidelines. However, they are crucial for uncovering clues and trends that help drive deeper experimental research hypotheses and questions. In science, the most robust evidence is typically gathered through systematic reviews with meta-analyses. These reviews rely heavily on rigorously conducted RCTs, and pools the data from these trials together to formulate a well-informed conclusion. Without concrete evidence from these reviews or RCTs, it is unlikely for us to sway decision makers worldwide to start prescribing and/or recommending the regular use of sauna bathing. We must be able to show with no reasonable doubt or bias, that this activity is indeed beneficial for ones' health, through high level scientific research that is well planned and executed. To do so, we will need to continue to improve our present collaborations, maintain regular communication, be transparent, and share our research ideas as a community.

Yu Suzuki: How online sauna community boost enthusiasm for saunas in Japan?

Sauna is now attracting more and more Japanese people, especially young people and women. The key driver of this growing enthusiasm for saunas in Japan is SAUNA IKITAI, the largest sauna search and social media service in Japan. A sauna database in SAUNA IKITAI has been created with sauna lovers all over Japan together and now over 10.000 saunas are available in search. The detailed sauna database enables sauna lovers to find their preferred style's saunas anywhere in Japan. SAUNA IKITAI also provides a post function for sharing their sauna experiences. All the posts are linked to the sauna database and sauna lovers can easily see how the sauna is enjoyed by other sauna lovers. Outdoor sauna, Food after sauna called as "Sauna-Meshi" and Sauna Trip called as "Sa-Tabi" are also popular among sauna lovers in Japan and SAUNA IKITAI also helps to enjoy them by the sauna search and social media function. The sauna search and social media for saunas help to evolve various styles of saunas and various styles of enjoying saunas in Japan.

The umbrella brand of the Therme Wien and the SILENT SPA

VAMED

VAMED was founded in 1982 and has since grown to become the world's leading full-service provider for hospitals and other healthcare facilities. The Group has implemented around 1,000 projects in 95 countries on five continents. The portfolio ranges from project development as well as planning and turnkey construction to maintenance, technical, commercial and infrastructural services and overall operational management in healthcare facilities. With its offer, VAMED covers all areas of health care from prevention and health tourism to acute care and rehabilitation and care. In addition, VAMED is a leading provider of rehabilitation services in Europe and, with VAMED Vitality World, the largest operator of spa and health resorts in Austria.

VAMED Vitality World

The internationally active health care group VAMED has been involved in the spa and wellness area since 1995. Under the competence brand VAMED Vitality World, founded in 2006, VAMED operates eight of the most popular spa and health resorts in Austria: the AQUA DOME – Tirol Therme Längenfeld, the SPA Resort Therme Geinberg, the Therme Laa – Hotel & Silent Spa, the St. Martins Therme & Lodge in Frauenkirchen, the Therme Wien, the Gesundheitszentrum Bad Sauerbrunn, the TAUERN SPA Zell am See – Kaprun and the la pura women's health resort kamptal in Gars am Kamp. The VAMED Vitality World is Austria's leading operator of spa and health resorts.

1) Therme Wien

On September 27th 2010 one of the most contemporary and biggest city spas in Europe has opened. The Therme Wien combines wellness, fitness and therapy experiences – which makes it so unique and versatile. Therme Wien visitors can enjoy the great variety of all the areas of the Therme Wien 364 days a year. Additionally, the Therme Wien has the most effective sulfuric spring in Europe, which makes a visit at the Therme Wien both, a relaxing and pleasing as well as health boosting experience.

The locality of the Therme Wien:

Inside the Therme Wien the following areas can be found:

- Different spa zones with a lot of pools, which represents a major part of the Therme Wien
- The impressive Sauna Stone, with a ladies' area, a men's area and a mixed sauna area
- The Tranquility Stone is the place for those, who love silence and want to enjoy some peaceful relaxation time
- The Adventure Stone for those, who want to enjoy themselves using the slides, diving platform and many more fun activities inside or other adventurous activities outside in the Wilderness
- The Beauty Stone for those want to enjoy some massage, treatments or other opportunities to pamper themselves
- The beautiful Four Seasons Garden in the outside area surrounding the Therme Wien
- The Relax! Lounge, the reserved relaxation area for the business class product (Relax! One Day Holiday) of the VAMED Vitality World

- The Therme Wien Fitness, which can be used as external guest or also during your stay at the Therme Wien
- The Therme Wien MED as a competence center for health and therapy
- And finally, the Relax! Terrace Lounge, a sperate outside area for the Relax! Day Spa guests alone

Facts and figures about the Therme Wien

- Approx. 75.000 sqm total area
- Approx. 4.000 sqm water area
- Approx. 3.000 sqm sauna area
- Approx. 6.000 sqm therapy area

The impressive sauna area in the Therme Wien

Relax, and return to your old self as you work up a sweat and feel the pent-up tension leave your body – the Sauna Stone section of Therme Wien was created with precisely this in mind. But what's particularly about this section of the spa is that there is a separate area for women only and another for men, as well as the customary unisex variety – so there's no longer any need for anyone to have mixed feelings about going to the sauna. Furthermore, all of the areas are nude areas. Whichever you choose, all of the steam rooms and saunas are generously proportioned. The Sauna Stone covers around 3,000sqm and is brimming with opportunities to soothe jangled nerves, melt into the reassuring warmth, withdraw for a while and recuperate. Finally, any culinary meets can be met in the Sauna Bistro.

The ladies' area

In the huge, international hub vienna, a lot of cultures are coming together. Therefore, a separate ladies' area is an important assent to have. The area is about 600 sqm big and consists of different assets.

Saunas and Steam Baths:

- Finish Sauna: Berry Sauna
- Organic Sauna: Rainbow Sauna
- Steam Bath: Early Morning Mist & Morning Sun

Swimming Pools:

- Hot tub, outdoor: 36°C
- Plunge pool: 18°C

The men's area

There is also a separate area for the men, which is also about 600sqm big. Similar to the women area, the following saunas and swimming pools can be found there, exclusively available to men.

Saunas and Steam Baths:

- Finish Sauna: Vine sauna & Herb Sauna
- Steam Bath: Autumn Sun & Sunset

Swimming Pools:

- Hot tub, outdoor: 36°C
- Plunge pool: 18°C

The mixed sauna area

The biggest area in the Sauna Stein is the mixed sauna area, which is about 1.200 sqm big and offers a great variety of saunas, steam baths and swimming pools, both indoor and outdoor.

Saunas and Steam Baths:

- Finish Sauna: Garden View, Arbor Sauna & Cellar Lane
- Organic Sauna: Bamboo Sauna
- Steam Bath: Morning Dew, Petal Bath & Herb Bath

Swimming Pools:

- Warm water pool, outdoor: 34°C
- Hot tub, outdoor: 36°C
- Plunge pool: 18°C
- Kneipp baths: 18°C and 36°C

The beautiful Sauna Garden

Recently sauna guests can expect a spacious, high-quality sauna garden with colorful flowering shrubs, herbs and sun loungers that invite you to relax and sunbathe. Terracing the lawn, colorfully flowering perennials and delicately fragrant herbs, in the form of a discovery path in the upper part of the garden, which ties in with the long-standing trees in the spa gardens, relax body and mind and influence well-being in a very natural way.

The sauna concept of the Therme Wien

Simply speaking, the sauna concept of the Therme Wien can be described with one word: Versatility. The following aspects combined result in creating this concept:

- The generous sauna infrastructure
- The vast range of sauna offers
- The combination of a traditional sauna culture in a modern city spa
- An urban location, but directly located in a green area, the Kurpark Oberlaa
- A versatile target group, which needs to addressed with a versatile Sauna concept

“Aufguss” in the Therme Wien

The “Aufguss” ceremony is an important part of the sauna experience in the Therme Wien. In all of the three sauna areas, different Sauna Aufguss rituals can be experienced. On the one hand, there are Aufguss rituals being performed by the Therme Wien sauna masters, on the other hand guests are also allowed – and this is also very

important in Austria – to do their on Aufguss in specific saunas at specific times. Furthermore, there are also a lot of saunas, where an automatic sauna Aufguss ritual is being performed. Addionally, in the steam baths specific rituals can be enjoyed where sauna amenties such as salt peelings are being included. Finally, specific magic moments according to the current season are being offered as well, for instance a Christmas special in December.

2) SILENT SPA

Therme Laa – Hotel & Silent Spa

The Therme Laa is a wellness resort, which is built-on three main areas: the Therme, the Hotel & the SILENT SPA.

The resort offers relaxation and indulgence 365 days a year with different highlights at any given weather. The Therme Laa – Hotel & Silent Spa provides a great variety of high-quality retreats in its exclusive areas, such as the SILENT SPA.

The SILENT SPA of Therme Laa: No day like any other

How nice it would be just to hear the water rushing. Not having to do anything. Just be there. Close your eyes. Leave the world outside. Arrive and switch off, let go and free your mind. Let yourself be pampered. No tomorrow, no yesterday. No day like any other.

Space for individual retreat

A door opens and a world of water and silence opens. A world full of relaxing possibilities and smart comfort. Time and rest are among the most valuable assets of our time. In order to leave the hectic everyday life behind for a while, special places are needed. The SILENT SPA of the Weinviertler Therme Laa is such a precious refuge. With the exclusive Premium Day Spa of Therme Laa (adults only), a unique space for individual retreat was created in 2016.

Warm thermal water, soft light and delicate fragrances, fine materials and exquisite service, allow our guests to consciously experience relaxation and return to themselves. Warm thermal water, soft light and delicate scents, noble materials and exquisite service allow our guests to consciously experience relaxation and return to themselves.

Architecture creates space for peace and quiet

The secret of the SILENT SPA experience lies in the skillful interplay of great ideas and finely thought-out details. Above all, the unique architecture creates an inimitably relaxing atmosphere. In the SILENT SPA, architect Wolfgang Vanek combines elements of sacred architecture with the luxury of modern bathing culture in the SILENT SPA: the center of the walk-in water landscape consisting of four ellipses is dominated by an octagonal tower in which a three-story cascade fountain provides a unique ambience. The ellipses are individually designed and offer a brine pool, spa suites and a steam bath in addition to comfortable reclining beds for retreat and relaxation. A high-quality sauna area with special aufguss ceremonies, an exercise room and restaurant & bar complete this unique structure.

Facts and figures about the SILENT SPA

- Approx. 3600 sqm total area
- Approx. 500 sqm water area (incl. reflecting pools)
- Approx. 400 sqm sauna area

- Approx. 100 sqm treatment area
- Structural connection to the Therme Laa
- Exclusive parking space including barrier system
- Admission only for adults over 16 years of age
- Total capacity: 142 guests at the same time

Pampering program at the highest level

First-class service is lived in the SILENT SPA: this includes a personal welcome, a harmonious wellness robe, small attentions, a varied pampering offer and the exclusive lounger service. The independent, partially certified organic cuisine of the SILENT SPA offers regional delicacies, which can be served to your lounger on request. When booking online, the personal berth can be reserved in advance and an incomparable day can be planned to recharge batteries.

In addition to the variety of different massages and cosmetic treatments, the two exclusive signature treatments "SILENTIUM" and "LEVITAS", which were specially developed for the SILENT SPA, provide particularly relaxing pampering moments.

The Sauna Concept

The sauna world in the SILENT SPA provides moments of complete relaxation with its aufgusses and ceremonies spread throughout the day. In addition to a herb garden with plunge pool, a gentle organic sauna (60°C) and a classic Finnish sauna (90°C), a steam bath and a salt meditation room with dry salt mist await guests in the indoor area. The sauna area is being operated as tadeonal nude area.

The sauna concept is just as exclusive as the SILENT SPA and its clientele itself. Traditional sauna Aufguss rituals are being combined with storytelling elements in order to create a luxury, exclusive sauna experience. These rituals are being called sauna ceremonies in the SILENT SPA. Furthermore, each of the unqiue sauna ceremonies is enhanced by the usage of high-quality sauna amenities like high quality, regional products such as a regional wine cream, which are healthy and a pleasure.

Since SILENT SPA guests also have free access to the vast area of the public thermal spa and the sauna world in the Therme Laa – Hotel & Silent Spa, SILENT SPA guests can enjoy – if they stay overnight in the hotel– up to 24 unique sauna rituals in the resort.

Find true inner peace: Movement ceremonies

In turbulent and stressful phases of life, it is easy to lose your inner balance. Finding the way back to the inner center with the SILENT SPA's movement ceremonies and time to reflect.

Recharging batteries with a yoga session in the unique water landscape, consciously feel into the body with breathing and movement exercises or let time stand still with a guided singing bowl meditation. In order to leave the world outside and seek peace and quietness, finding into the Room of Silence.

Garden of Eden: The green paradise

SILENT SPA visitors will find even more relaxation in the Garden of Eden in summer. The flourishing paradise caresses the premium day spa of Therme Laa. A green realm that blossoms in full splendor in keeping with the hot and dry Weinviertel climate and ensures peace and relaxation.

Visually, the Garden of Eden enchants with an ensemble of numerous trees, shrubs and flowers, including robinia, cypresses, lime trees and maple trees. This flora was skillfully arranged by the Lower Austrian nursery „Kittenberger Erlebnisgärten“. It offers a wonderful place to enjoy and linger in the warm months. Granite blocks from the Waldviertel region frame the luxury retreat and create a natural opportunity for strolling, sitting and soaking up the sun. The harmonious symbiosis of plant kingdom, sunbathing areas, relaxation zones and a fantastic restaurant terrace leaves nothing to be desired.

At the beginning there was fire

When does culture of mankind started? At the moment when the fire was controlled and the first ideas of utilizing fire were created. When there is fire the other essential element of life is water. In combination the basic innovation of cooking is discovered and of course the accompanied appearance of steam. In combination with a tent of animal skin or a cave, the steam bath was created.

With the moment of exploring the benefits of hot water and steam for healing and relaxation the antagonist aspects of human life, manifested in the nervous system, were taken into a mechanic control. To use the water of hot springs is definitely older than mankind, which we discover by the macaques in Japan and traded by the journey of our genes to the so-called modern man, but the transformation into a culture practice is solely human.

Cultural transformations

Sweat rituals have been practiced by many cultures throughout the world for thousands of years. Our ancient ancestors established the thermal bath in many forms. They were built from different materials and they used different kinds of heat source, temperatures or rituals but with a common purpose in order to improve social life and to facilitate mental and physical healing, purification and relaxation.

The most known are:

+ Native American Sweat Lodge
+ Mexican and Central American El Temazcal
+ Irish Sweat House
+ Finnish Sauna
+ The Greco Roman Baths
+ South African Sifutu
+ Islamic Hammam
+ Russian Banya
+ Korean Hanjeungmak
+ Japanese public baths and Mushi-Buro saunas

Mechanization takes control

»The role bathing plays within a culture reveals the culture's attitude toward human relaxation, it is a measure of how far individual well-being is regarded as an indispensable part of community life. «

SIEGFRIED GIEDEON | 1888 – 1968

In his book Siegfried Giedeon explains the distribution of different bathing techniques in relation to the individual attitudes towards a relaxation culture in Europe and North Africa from the Greek Gymnasion, the Roman Thermae and the Islamic baths to the present.

The roman bath

For Romans, bathing was a social event. Public baths, in fact, were one of the few places where large numbers of Romans gathered daily in an informal context. They went to meet friends, drink wine, pick up sexual partners, and generally while away the idle afternoon hours.

The way of socializing was so important to the roman culture that the largest buildings ever made were bath houses. In the ancient city Augusta Treverorum, today called Trier in Mid-West-Germany, one can experience the dimensions of the roman construction in relation to the contemporary bath house, which could be placed completely in the changing rooms of the Imperial baths.

The Islamic bath

»One should go to the bath with a group of educated and learned friends who know stories, anecdotes and tales, for this drives away sorrow, exhilarates the mind and glad-dens the heart" (fol. 87b). «

MUHAMMAD 'ABD AL-RA'UF AL-MUNAWI | 1545 – 1621

The mythical stories about the foreign cultures and the way traveling was getting affordable to larger groups of society, led to an eclectic architectural style in European cities. The former king of Baden Württemberg asked the architect Karl Ludwig von Zanth to build a fairy architecture of an imagined orient, which is today the botanical garden of “Wilhelma”. In this way of building conception and sources, the oriental bath in Büchsenstraße was built from 1889 - 1892.

In Asia the same procedure of transforming cities and the way people live together, led to a decline of the small public inner-city bathhouse around the corner. This great loss of social culture was perfectly and very emotionally described in the movie »XIZAO – SHOWER« BY ZHANG YANG | 1999.

Public bath houses ones were found in the centre of every city, but especially in Europe, after WW 2, there was a move to commercial public baths in the periphery.

The city bathhouse died out. How could the bathhouse become again a form of cultural and social space?

»The Bathhouse is a space of anti-conflict, anti-competition and anti-hierarchy. «

TUOMAS TOIVONEN | KULTTUURISAUNA | 2022

Cassandra Cavanah stated in her contribution to the Global Wellness Institute’s 2022 trend report that affordable Wellness will come to a city near you. With a focus on developments in the US and South America, multimillion dollar investments are taken to build new entities for wellness in metropolitan areas. Besides hydro thermal experiences like saunas, steam baths and pools, the social aspects of gathering in a dense atmospheric place were the drivers of the renaissance of urban public wellness areas.

Examples featuring the reviving of a historic bathing place in San Francisco, the Alchemy Springs Communal Bathhouse by architect Olle Lundberg and the developments by Aire Ancient baths in various cities in US and Europe.

Future projects of the interior architect’s office SCHIENBEIN +PIER will start soon

Taken into consideration that building construction will become more and more expensive due to various global crises, new ideas have to be developed to get public bath houses back into the cityscape.

One suggestion is to standardize the building process by industrial prefabrication and serial production. Robotic perfection and a planning process supported by Building Information Modelling will result into better quality and lower costs. This is the innovation behind the SPA CUBES featured by the Italian SPA developer BBSPA.

Another proposal to erect healthier and sustainable buildings is the reinvention of the rammed earth construction technique. With machines the solidification process is made in shorter time and with reliable results. A 60 cm thick rammed earth wall sits on a platform of recycled concrete to protect the clay from getting “wet feet”. The second floor and the roof construction of the SPA situated in a commercial area is done in wooden frame work.

In this way the building provides a perfect climate inside, the material is sourced locally and if necessary it is easy to be disassembled to single origin items. Easy building, reduction the amount of materials and dismount ability will take the architectural planning and building methods to a better future of all.

When operating public sauna facilities, cost-effectiveness and safety play an important role. KLAFS, the world market leader for sauna, pool and spa has been offering innovative solutions in this area for many years.

A benefit for every visitor: the sauna bath not only resonates with the deep-rooted need for warmth, light and security, but also has an enormous effect on health and it is hard to imagine the wellness and fitness industry without it. At the same time, saunas by their very nature consume energy to generate heat - a topic that raises questions about energy consumption and cost factors, especially in the wake of rising energy prices, for every sauna operator and those considering a purchase. Fortunately, there are numerous energy-efficient solutions to help guests and members continue to enjoy the added value of a sauna visit. The world's leading sauna manufacturer, KLAFS, knows where the most energy can be lost and how saunas can be operated in an energy- and cost-efficient manner.

Equal sauna enjoyment through energy-efficient measures

Wellness is a megatrend of our time. Both the enjoyment of the pristine and the awareness of mental, emotional and physical well-being as well as the interest in health and fitness are increasingly becoming the focus of people's attention. Spas and gyms offering saunas have recently become increasingly attractive to the younger generation as well. The sauna has become a place of mindfulness, encounter and, above all, preventive strengthening of the body: The warm climate not only trains the cardiovascular system and strengthens immune cells, it can also lower high blood pressure and alleviate circulatory disorders, according to a study by Charité Berlin. In addition, regular sauna sessions support muscle regeneration after sports and can calm the autonomic nervous system - the positive effects are numerous. At the same time, rising electricity and gas prices call for innovative and energy-efficient solutions to meet the increasing search for moments of relaxation in the future. After all, sauna offerings can increase the number of guests and their loyalty many times over. The world's leading sauna manufacturer, KLAFS from Schwäbisch Hall, recognized the trend years ago and anchored the responsible use of resources in its corporate culture long before the energy crisis: energy and costs can be saved enormously through high quality materials and workmanship and a sauna entirely from one source.

Not all feel-good climates are the same

The interaction of stove, air circulation and wood ensures that the heat in the sauna is evenly distributed and retained, so that ideally there is a warm, comfortable feel-good climate at all times. "But not all feel-good climates are the same," explains Markus Gäbele, head of development and design at KLAFS. "If savings are made on the quality of the sauna, heat is quickly lost in one place or another. This not only makes for sacrifices in the sauna experience, but also for a large loss of energy and thus enormous costs." The quality of each individual sauna element therefore plays arguably the most important role in terms of heat storage and energy savings. "That's why we at KLAFS rely on state-of-the-art manufacturing technology and cherish the claim that all technical parameters are right, so that the ideal feel-good climate prevails throughout the entire sauna session and no unnecessary energy is lost," says Gäbele. When developing its products, KLAFS took ecological considerations into account years ago and developed a GREEN SAUNA package that combines energy-efficient and technological solutions and reduces energy losses by up to 40 percent without having to sacrifice comfort and design.

Greatest heat loss through ventilation and transmission

To do this, you first need to know where the most energy is lost: "Since the Deutscher Sauna-Bund requires a 5 to 10-fold air exchange for a balanced feel-good climate in commercial saunas, the energy loss through ventilation is the greatest and, together with heat transmission via the ceiling, accounts for up to 75 percent," explains the expert. With the help of the patented climate manager, the loss through the exhaust air can be reduced by about 35 percent. The system analyzes the sauna air depending on cabin air quality, sauna size, number of sauna guests or heating and aufguss phases and then ensures automatic and optimized regulation of air supply and exhaust. At the

same time, the EcoPlus thermal ceiling ensures that the heat remains in the cabin significantly longer thanks to a sophisticated design on the ceiling structure. In short: the same heat with significantly less

Further effective energy savings result from a temporal frequentation of the saunas and a reduction of the temperature. KLAFS makes this possible with a central control of the sauna system: Via TOUCHCONTROL Professional, operators can control their saunas differently in terms of time and centrally, without compromising the feel-good climate of the guests. In this way, it is not only possible to control the heater and take into account different heating times, but also to reduce the bathing temperature from the usual 100 degrees Celsius to 90 degrees Celsius at off-peak times or to switch off the sauna before the end of operation in order to use the residual heat.

Same warmth despite glass front

If one still associates a small rustic-looking wooden box with the sauna of the past, the design concept of saunas and steam baths today is often characterized by visual expansiveness and comforting exclusivity. Especially continuous glass fronts correspond with this desire - they give every sauna a noble frame, provide transparency and an open atmosphere. However, conventional glass fronts consist of single glass and are thus a sure guarantee for high heat loss. KLAFS has therefore developed an insulating glass front that comparatively saves up to 80 percent energy. The insulating glass has the U-value (heat transfer coefficient) equivalent to modern windows in private housing. In addition, less energy is already required when heating up the cabin, as the heat is retained in the cabin. With KLAFS saunas, therefore, customers do not have to sacrifice any preferences - the manufacturer can offer equally energy-efficient sauna pleasure for saunas with large glass fronts.

Introduction: The energy transition from fossil to renewable energy requires the integration of energy storage. While the public debate focuses mainly on electrical energy storage, the analysis of the total energy consumption reveals that a large share of energy is final consumed in the form of thermal energy. Furthermore, in the personal perception, the energy transition is often associated with a required reduction of energy consumption and thus with a reduction of the living standard. However, from a technical point of view, it can be possible to maintain our standard of living while achieving the goals of the energy transition. Against this background, the presented research project addresses a wellness and comfort product with a high energy demand: the sauna. The aim of the project is to develop and demonstrate a so-called Zero-Energy-Sauna. In general, a Zero-Energy-Sauna is a sauna, which fully covers its energy demand through locally available renewable energy sources.

Materials and Methods: In a preliminary study, various concepts have been systematically derived and assessed. One innovative concept has been patented and was implemented in the presented research project. The implemented concept adopts solar energy and applies two types of thermal energy storage: a pressurized, stratified hot water storage and a closed low-pressure adsorption storage. The main purpose of the hot water storage is to provide heat, while the purpose of the adsorption storage is to provide steam. In a first step, simulation models of the two thermal energy storage were developed. The model of the hot water storage considers the effect of natural convection, which is especially important when hot water is injected into the storage at a height of lower temperature. For the adsorption storage, a previously developed and published model was adopted. The model was extended by internal heat exchanger fins and a metal lid. Based on these models, different charging and discharging scenarios as well as different designs of the thermal energy storages were examined by means of numerical simulation. The derived optimum designs provided the blueprints for the thermal energy storages integrated in the Zero-Energy-Sauna. Subsequently, the Zero-Energy-Sauna was constructed and extensive experimental studies were conducted over several month during winter to investigate the behavior of the two thermal energy storages and to evaluate the overall performance of the Zero-Energy-Sauna under practical conditions.

Results: The experimental studies continuously covered the repeated charging and discharging cycles of the thermal energy storages. During the charging phase, the charging power from the solar thermal collectors as well as the photovoltaic modules was monitored and the charging state of the two thermal energy storages was determined by measuring temperature distribution, pressure and water load. During discharging, the temperature distribution in the sauna room as well as the humidity were measured, while continuing the measurement of the charging state of the thermal energy storages. The results were compared against the predictions of the numerical simulations and demonstrate the successful operation of the realized Zero-Energy-Sauna.

Hans-Helmut Schaper: Optimized energetic sauna and bath operation in the focus of the current global resources

In the following you will find the presentation of the talks of Mr. Schaper. The talk dealt with the question: How can sauna and bathing facilities still be operated in the future under the currently changed conditions of energy supply? Possibilities are shown to realize the sauna and bathing operation without the consumption of fossil resources and thus climate-neutral. Decentralized solutions are in the foreground.

Opimized energetic sauna and bath operation in the focus the current global recoureses

Stuttgart 26.10.2022



planungsgruppe

Beratende Ingenieure

Saunaanlagen heute

Wasserwelt Langenhagen

Saunaanlagen heute

Wasserwelt Langenhagen

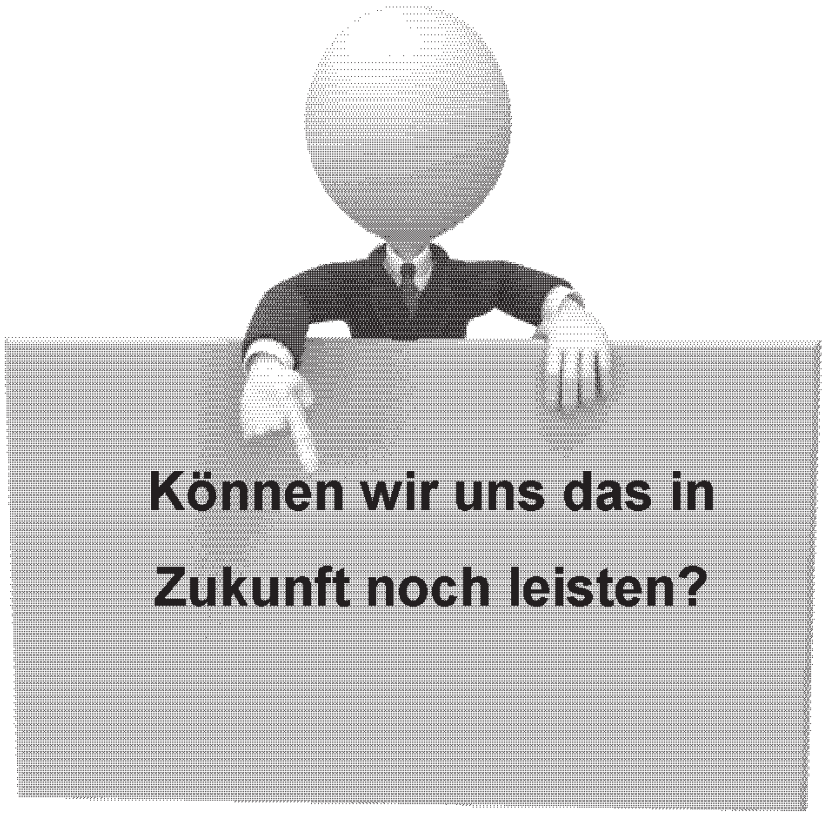
Saunaanlagen heute

Neukirchen-Vluyn

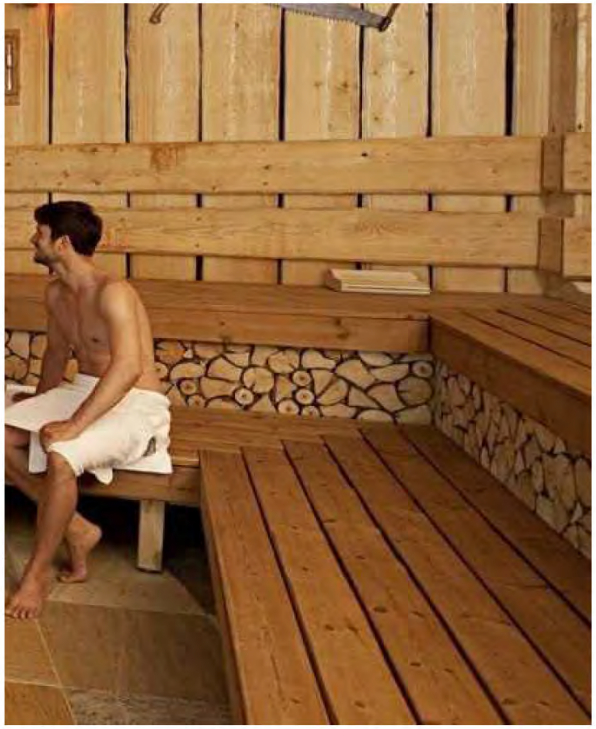
Saunaanlagen heute

Hotel Heselbacher Hof

Das alles benötigt eine Menge Energie !!


Können wir uns das in
Zukunft noch leisten?

Saunaanlagen heute



Energiedaten Saunaanlage

Energiebedarf Saunaanlage		4 Personenhaushalt
Wärmebedarf	510 MWh/a	15 MWh/a
Strombedarf	320 MWh/a	5 MWh/a

CO_2 Emission Saunaanlage		4 Personenhaushalt
Erdgas	103 t CO_2/a	3 t CO_2/a
Strommix	128 t CO_2/a	2 t CO_2/a

Saunaanlagen heute

510 MWh/a Wärme bei einem Gaspreis von 25 Ct/kWh kosten heute: 140.250 €

Das waren vor einem Jahr bei einem Gaspreis von 6 Ct noch 33.600 €

Das heißt die Kosten haben sich mehr als vervierfacht

320 MWh/a Strom bei einem Strompreis von 40 Ct/kWh kosten heute 128.000 €

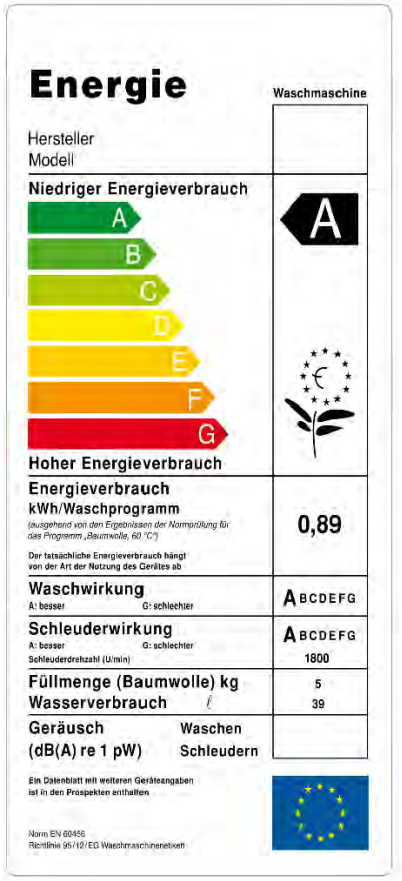
Das waren vor einem Jahr bei einem Strompreis von 25 Ct kWh noch 80.000 €

Das sind ca. 1,5 mal soviel

Energieeffizienz

Prinzip Energievermeidung

Die beste Energie ist die, die ich nicht brauche



Saunakabine

Saunakabine

Effizienten Saunaofen einbauen

Größe des Ofen an den Saunaraum anpassen

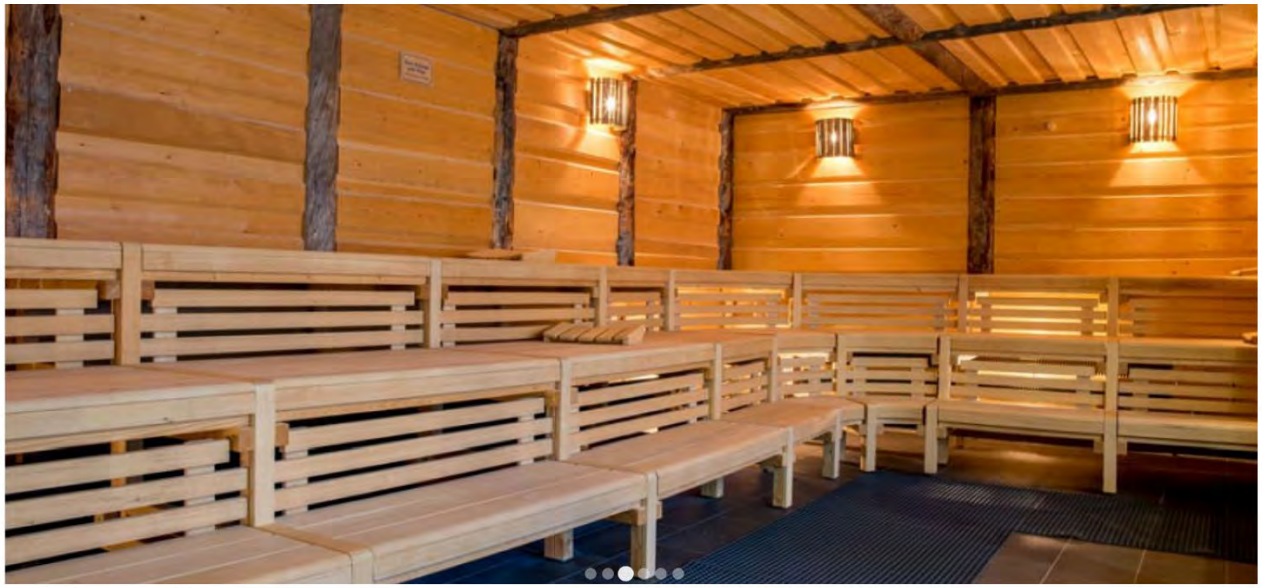
Vorerwärmung Saunakabine aus Abwärme z.B. BHKW

Fußbodenkühlung Saunaraum zur Raumheizung nutzen

Ausführung der Transmissionsflächen optimieren

Lüftung des Saunaraums mit Wärmerückgewinnung ausführen

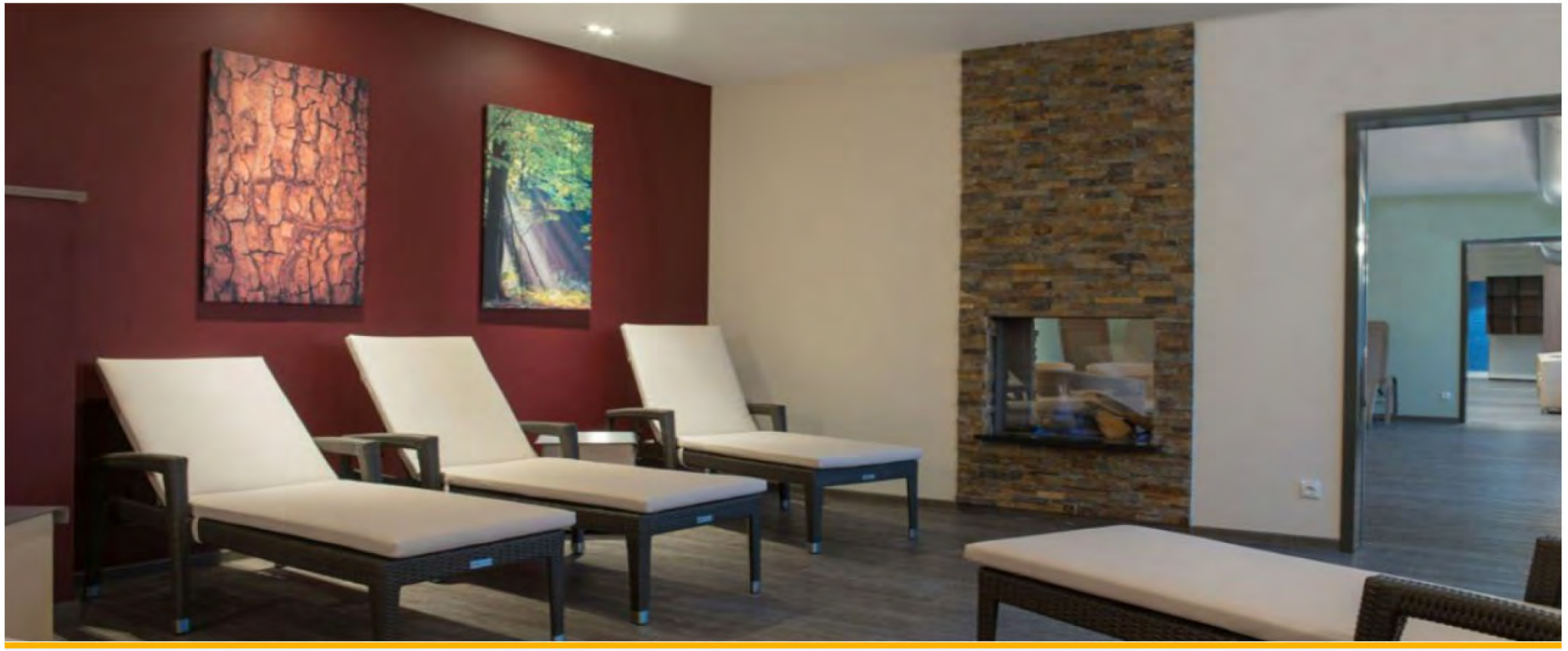
Energieeffizienz in Saunaanlagen



Rippenrohr-Heizkörper zur Vorerwärmung der Saunakabine

Gebäudehülle Ausführung Aussensauna

Vorräume, Duschen, Ruheräume



SaWanne Sangerhausen

Vorräume, Duschen, Ruheräume

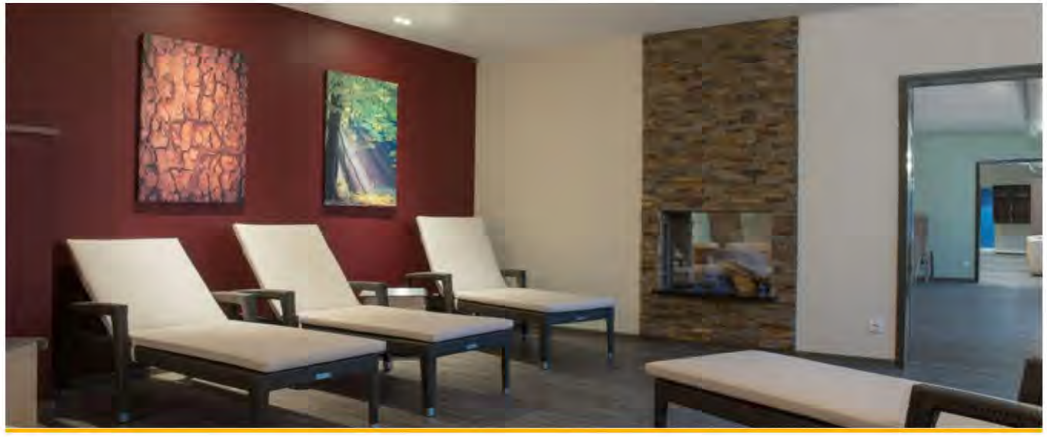
Gebäudehülle optimieren (z.B. KFW 55)

Niedertemperatursysteme für Raumheizung

Lüftung mit hocheffizienter Wärmerückgewinnung ausführen

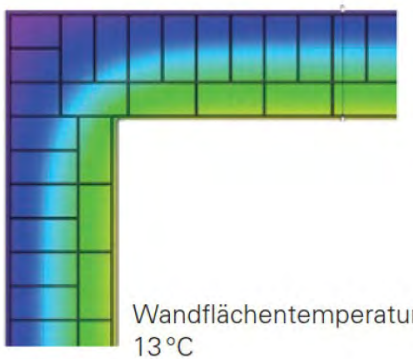
Beleuchtung für Sehaufgaben tageslichtabhängig steuern

Optimierte Steuerung der technischen Anlagen über eine GLT

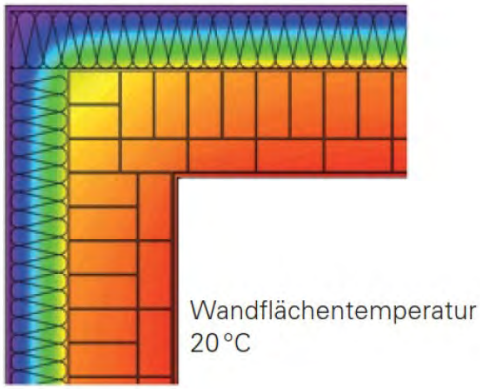


SaWanne Sangerhausen

Energieeffizienz in Saunaanlagen



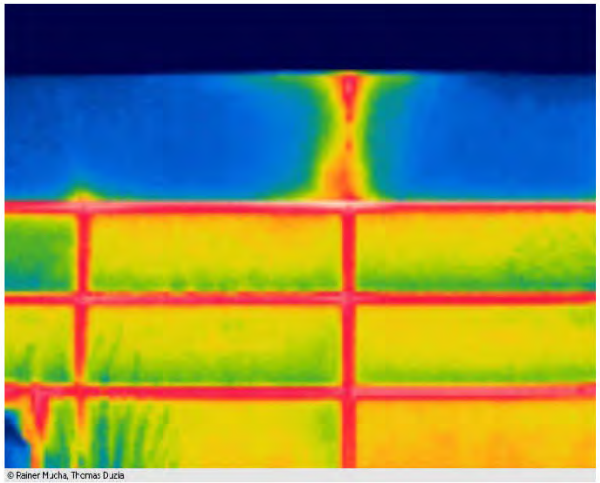
Ecke Außenwand ungedämmt



Ecke Außenwand mit 20 cm
Wärmedämmverbundsystem

Gebäudehülle optimieren

Thermografie



3-Scheibenverglasung

Schwimmbad-Bereiche

Elan Hildesheim

Energieeffizienz in Saunaanlagen

Schwimmbad-Bereiche

Beckenwasserumwälzung nachts absenken

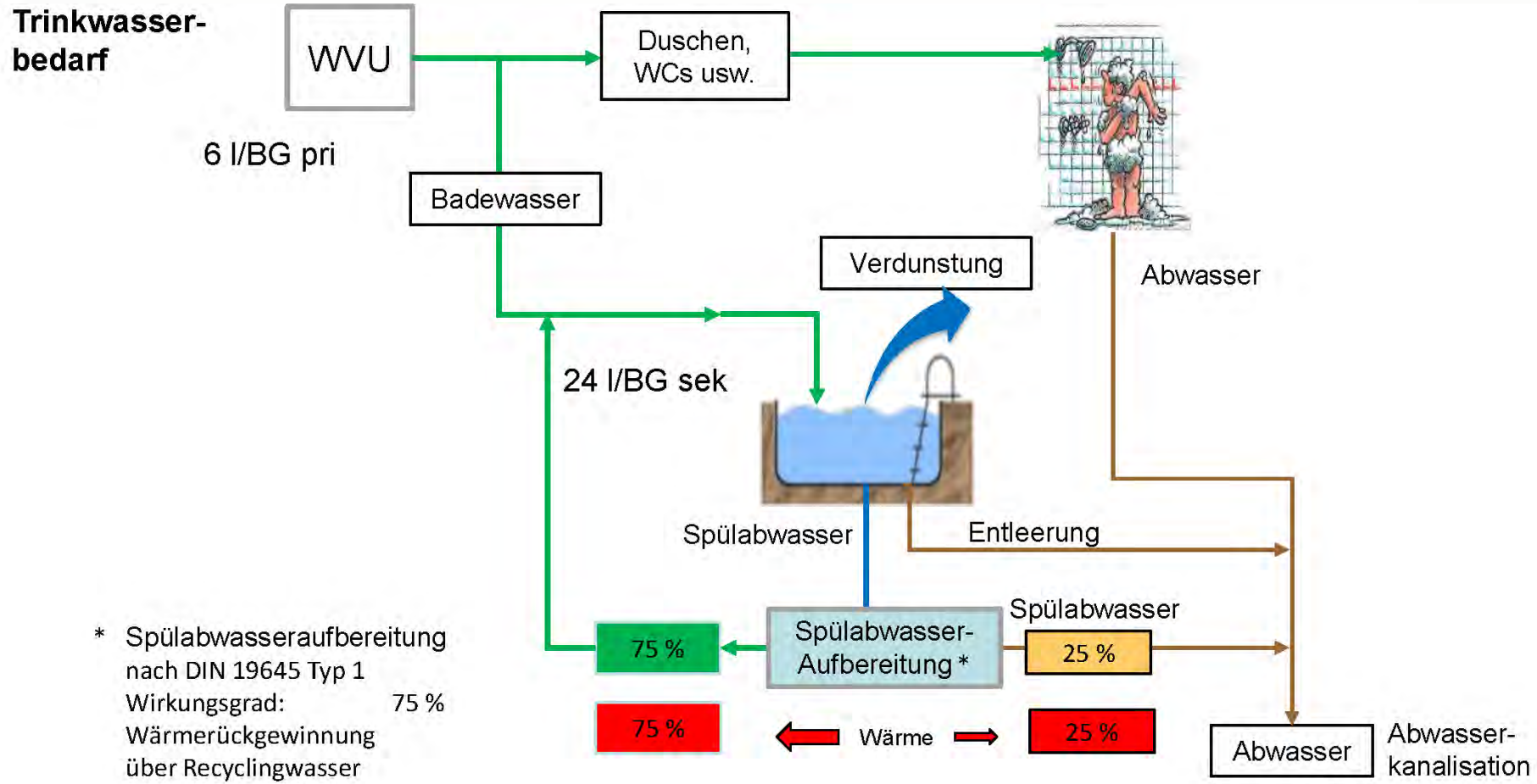
Bei beheizten Außenbecken Beckenabdeckung vorsehen

Wasserrecycling zur Wärmerückgewinnung

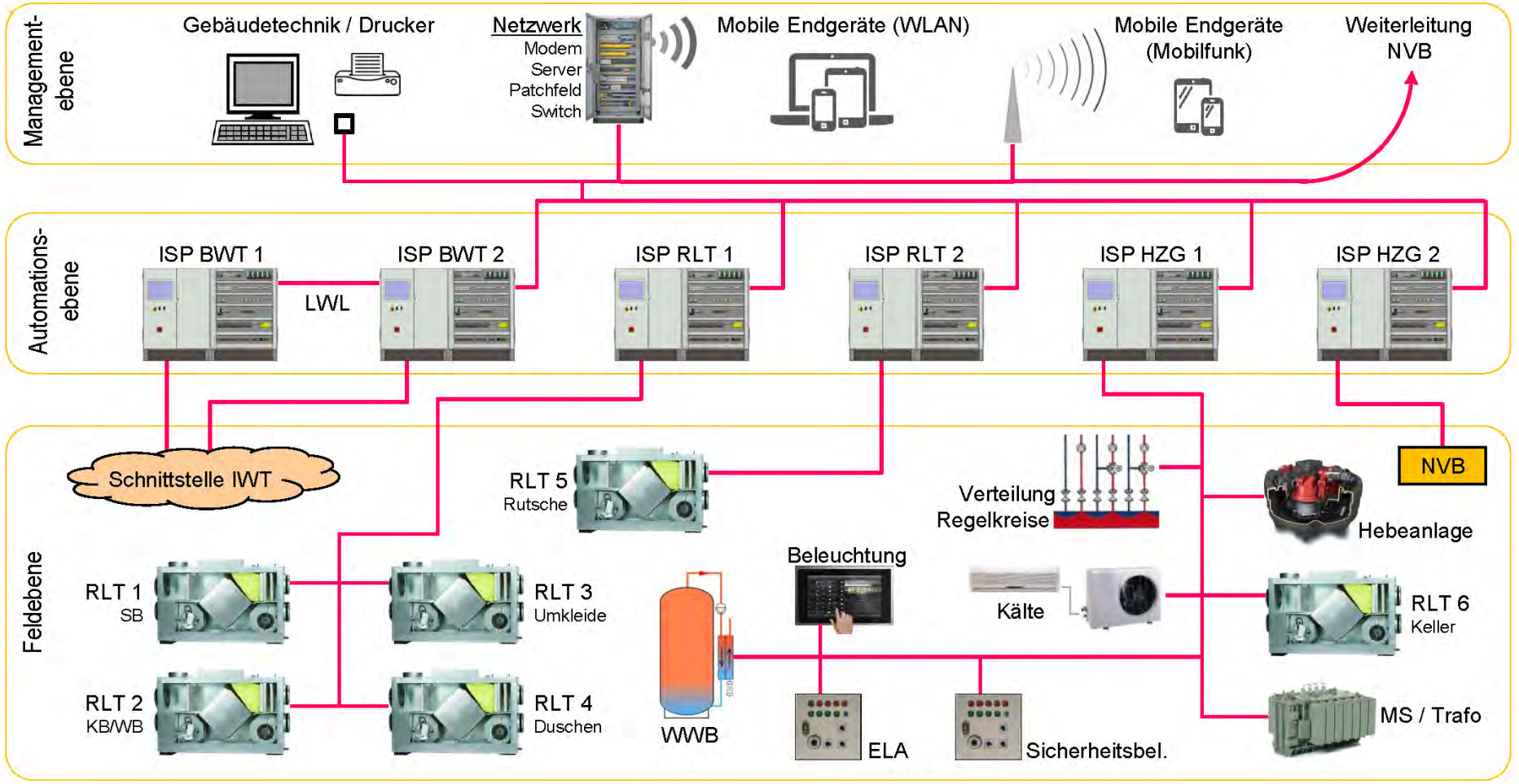
Beleuchtung für Sehaufgaben tageslichtabhängig steuern

Optimierte Steuerung der technischen Anlagen über eine GLT

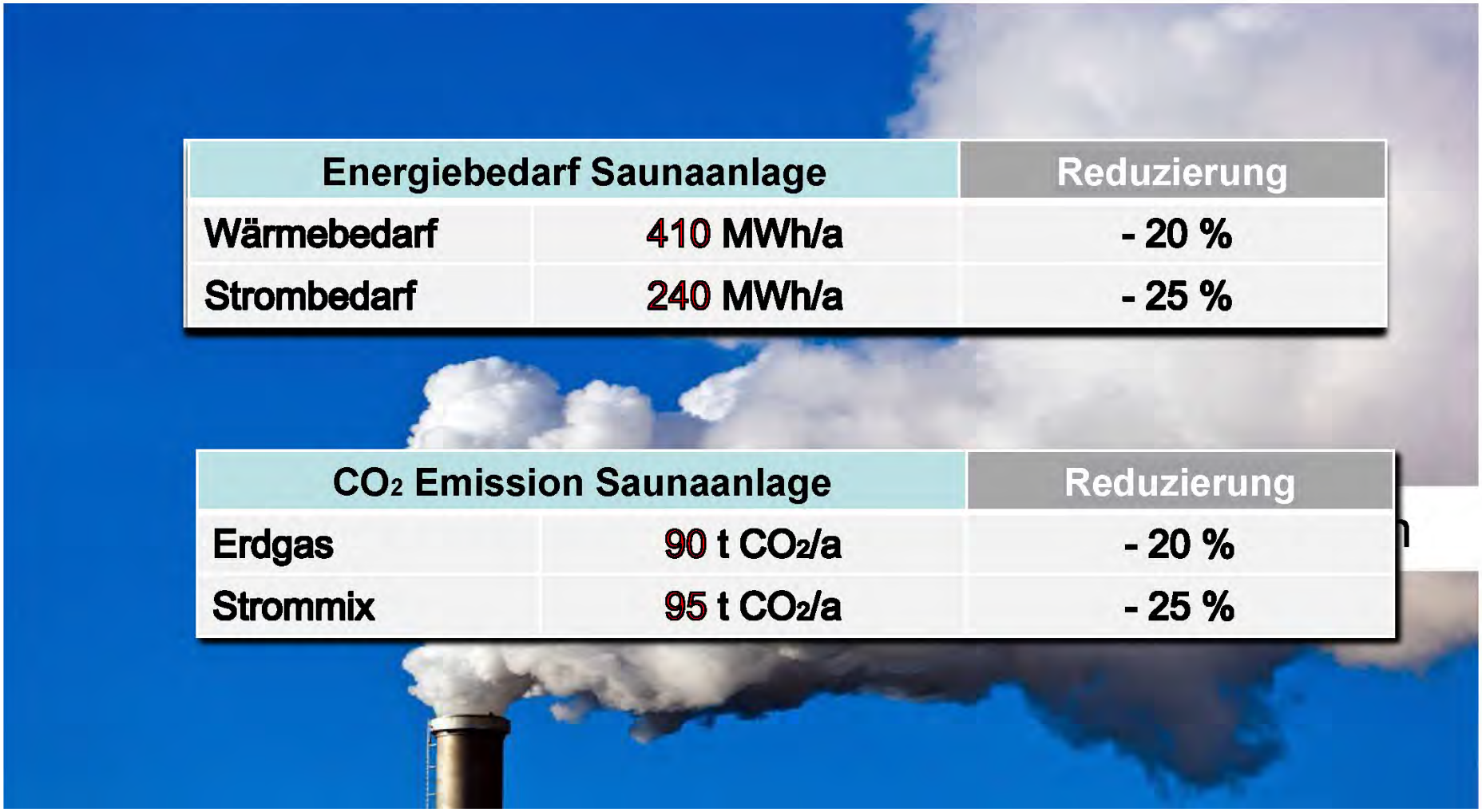
Energieeffizienz in Saunaanlagen



Anlagentopologie einer GLT



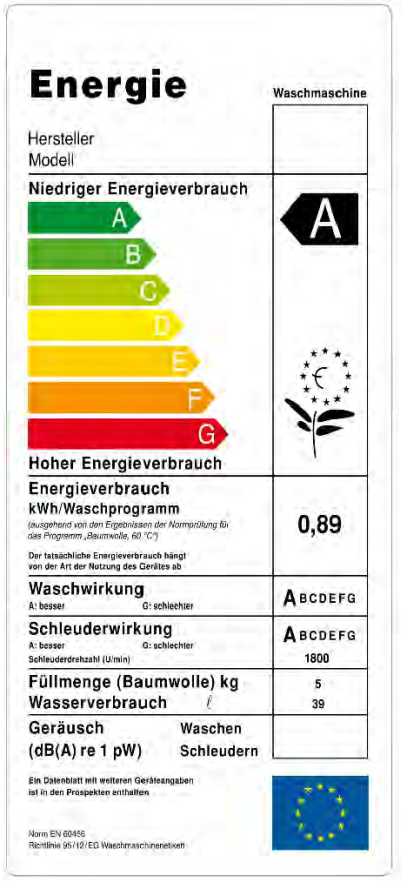
Energiedaten Saunaanlage



Energiebedarf Saunaanlage		Reduzierung
Wärmebedarf	410 MWh/a	- 20 %
Strombedarf	240 MWh/a	- 25 %

CO_2 Emission Saunaanlage		Reduzierung
Erdgas	90 t CO_2/a	- 20 %
Strommix	95 t CO_2/a	- 25 %

Deckung des Energiebedarfs der trotz aller Energieeffizienzmaßnahmen noch benötigt wird



Quellen zur Wärmeerzeugung

Erdöl

279 g CO_2 /kWh

Erdgas

202 g CO_2 /kWh

Quellen zur Wärmeerzeugung

Erdöl

279 g CO_2 /kWh

Erdgas

202 g CO_2 /kWh

Was sind die Alternativen?

Quellen zur Wärmeerzeugung

Biogas (100 %)

0 g CO_2 /kWh (wird derzeit in Frage gestellt)

Ökögas oder Klimagas

0 -202 g CO_2 /kWh

Quellen zur Wärmeerzeugung

Biomasse

Holzscheite, Pellets, Hackschnitzel

0 g CO_2 /kWh ohne Hilfsenergien

Solarenergie

0 g CO_2 /kWh ohne Hilfsenergien

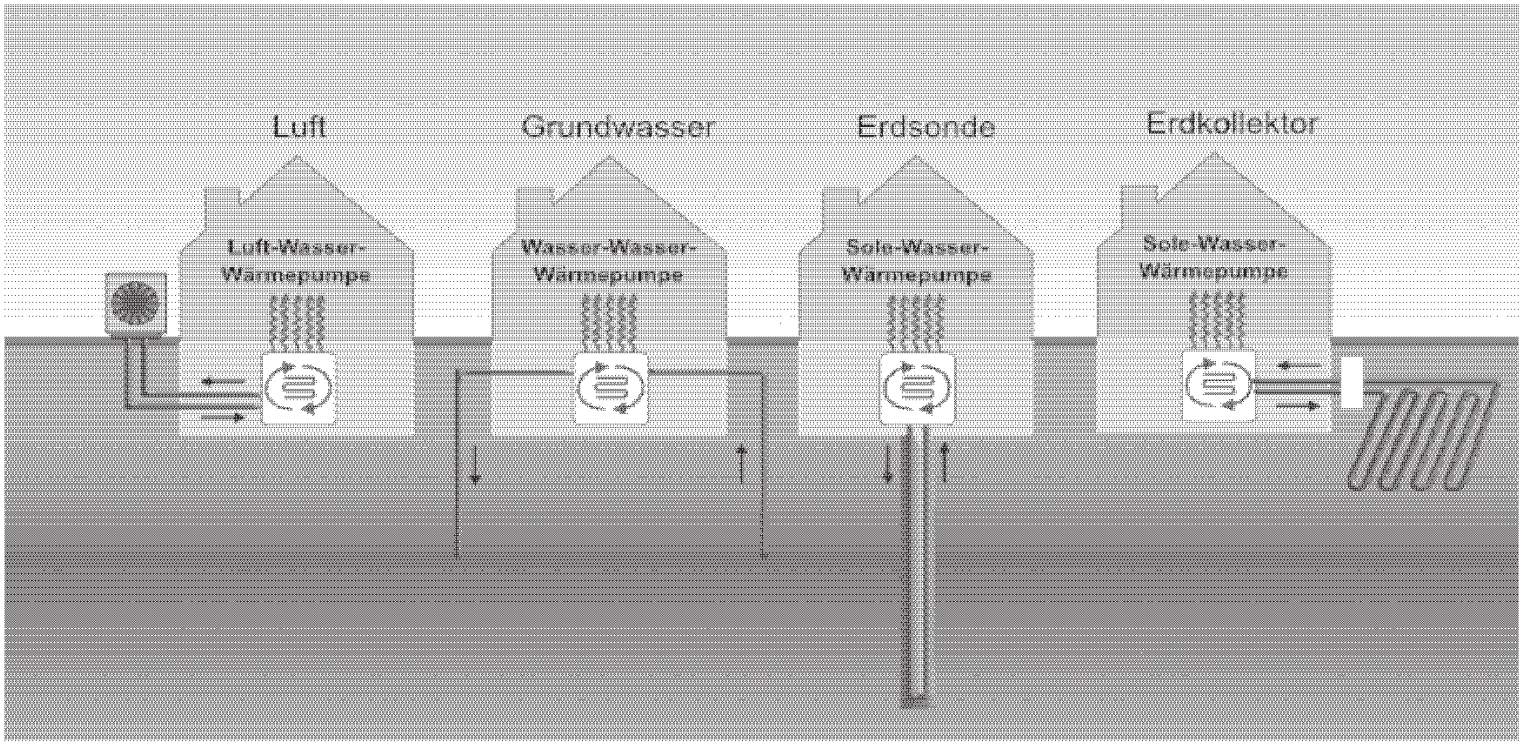
Wärmeerzeuger

Hackschnitzelkessel,
Pelletkessel oder
Scheitholzkessel

Bildquelle: KWB

Solarthermie

Wärmepumpe



Quelle: Leitfaden Geothermie

Hilfsenergie Strom für Betrieb der Wärmepumpe erforderlich

Quellen zur Wärmeerzeugung

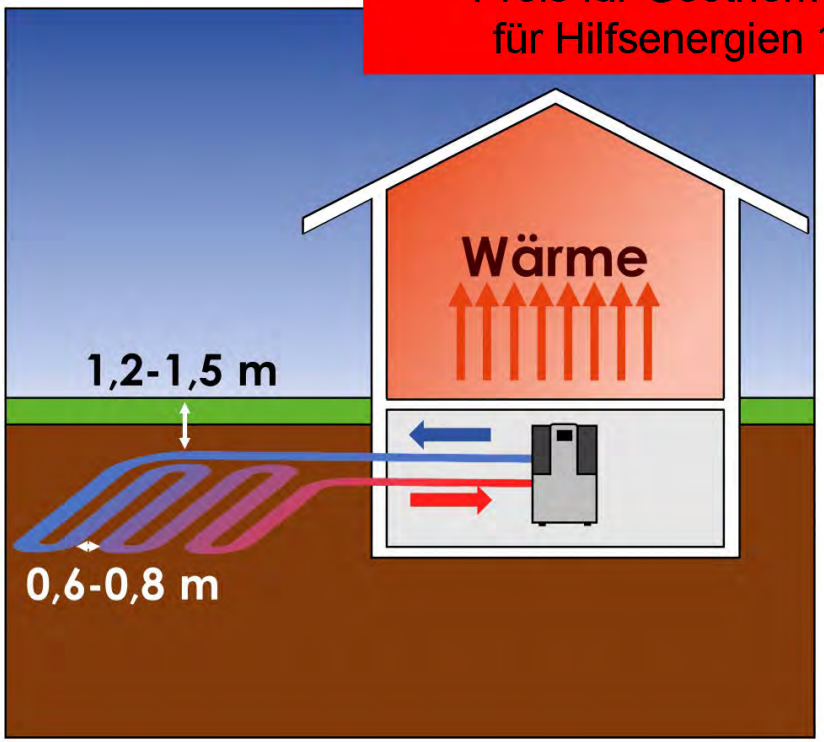
Erdwärme Oberflächen-nah

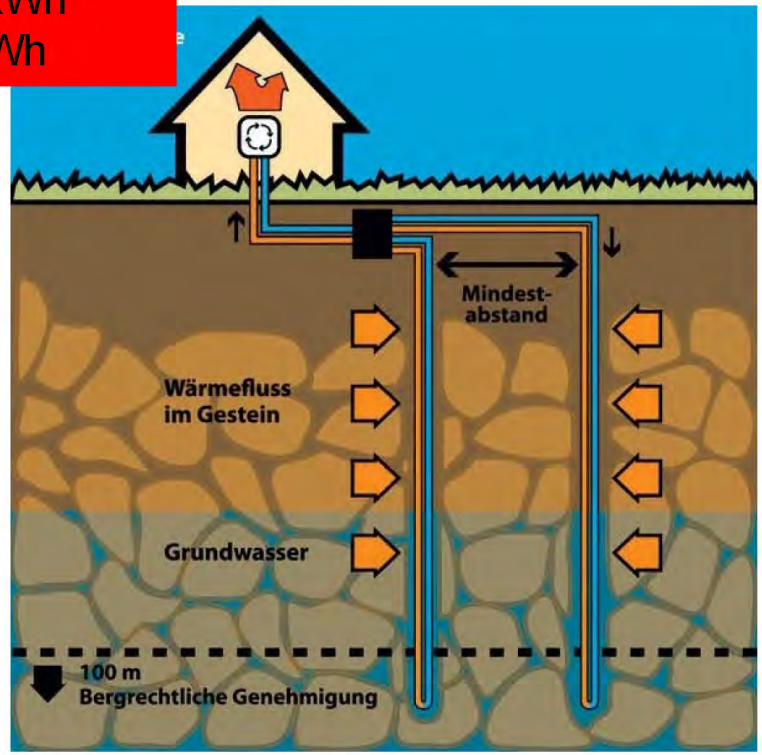
0 g CO_2 /kWh ohne Hilfsenergien

Erdwärme Tiefengeothermie

0 g CO_2 /kWh ohne Hilfsenergien

Preis für Geothermie 0 €/kWh
für Hilfsenergien 13 Ct/kWh

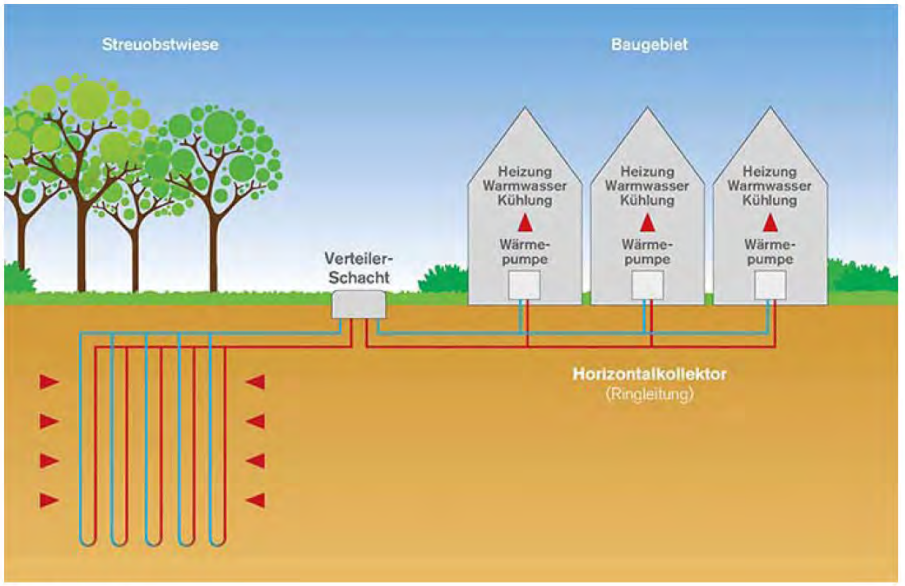




Quelle: Leitfaden Geothermie

Kaltes Nahwärmenetz

Quelle:Klimaschutz Niedersachsen



Quelle:Barthel

Stromerzeuger

Strommix

401 g CO_2 /kWh

Netz des Stromversorger

Ökostrom

0 g CO_2 /kWh bei 100 %

Preis für Strommix derzeit bei 40 Ct/kWh

Preis für 100 % Ökostrom derzeit bei 40 Ct/kWh bis 60 Ct/kWh

Stromerzeuger

BHKW

0 g CO2 /kWh nur für den Stromanteil

Preis für BHKW-Strom derzeit bei 22 Ct/kWh

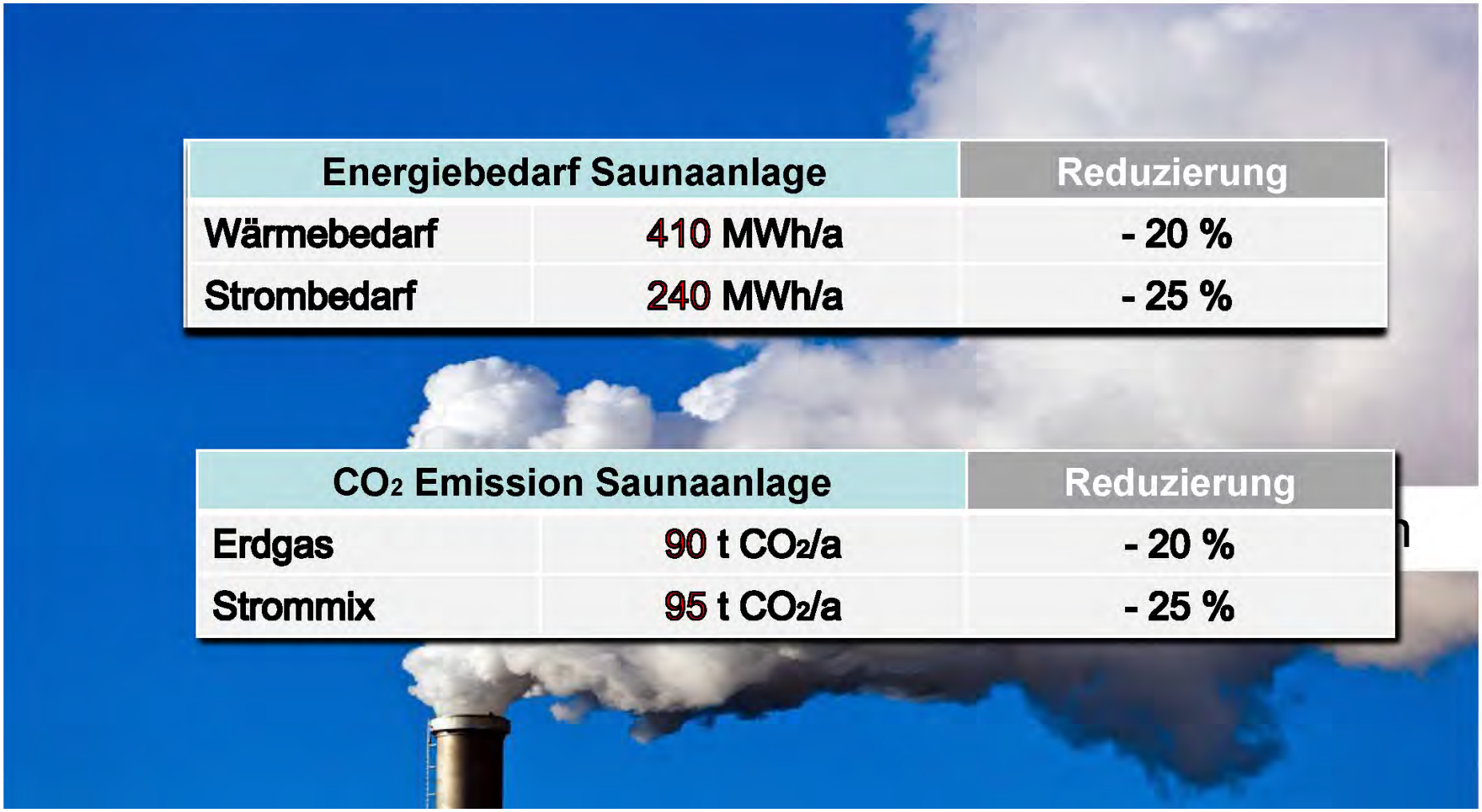
Photovoltaik

0 g CO_2 /kWh

Preis für PV-Strom derzeit bei 0 Ct/kWh

Möglichkeiten der Energieversorgung

Energiedaten Saunaanlage

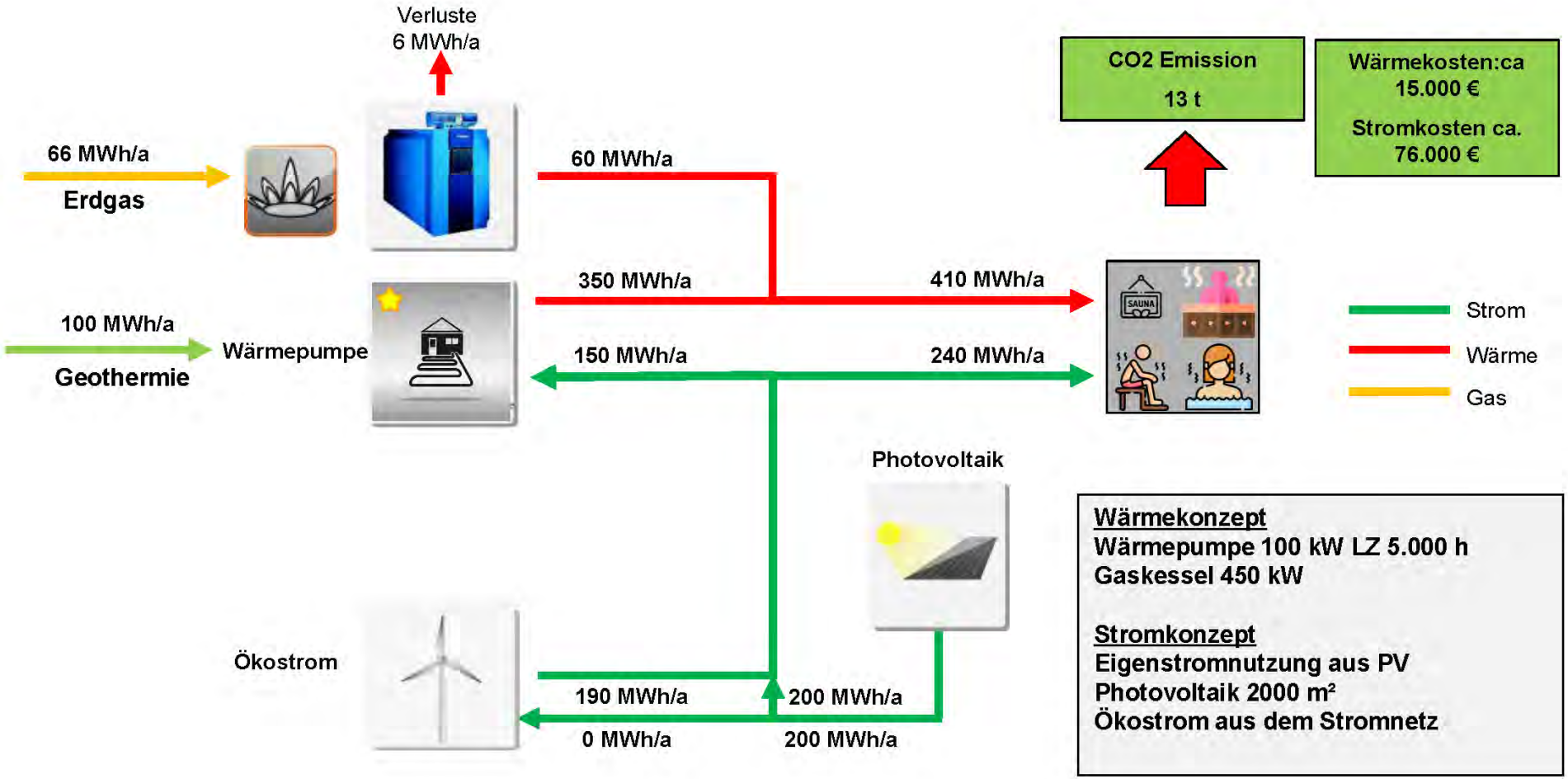


Energiebedarf Saunaanlage		Reduzierung
Wärmebedarf	410 MWh/a	- 20 %
Strombedarf	240 MWh/a	- 25 %

CO_2 Emission Saunaanlage		Reduzierung
Erdgas	90 t CO_2/a	- 20 %
Strommix	95 t CO_2/a	- 25 %

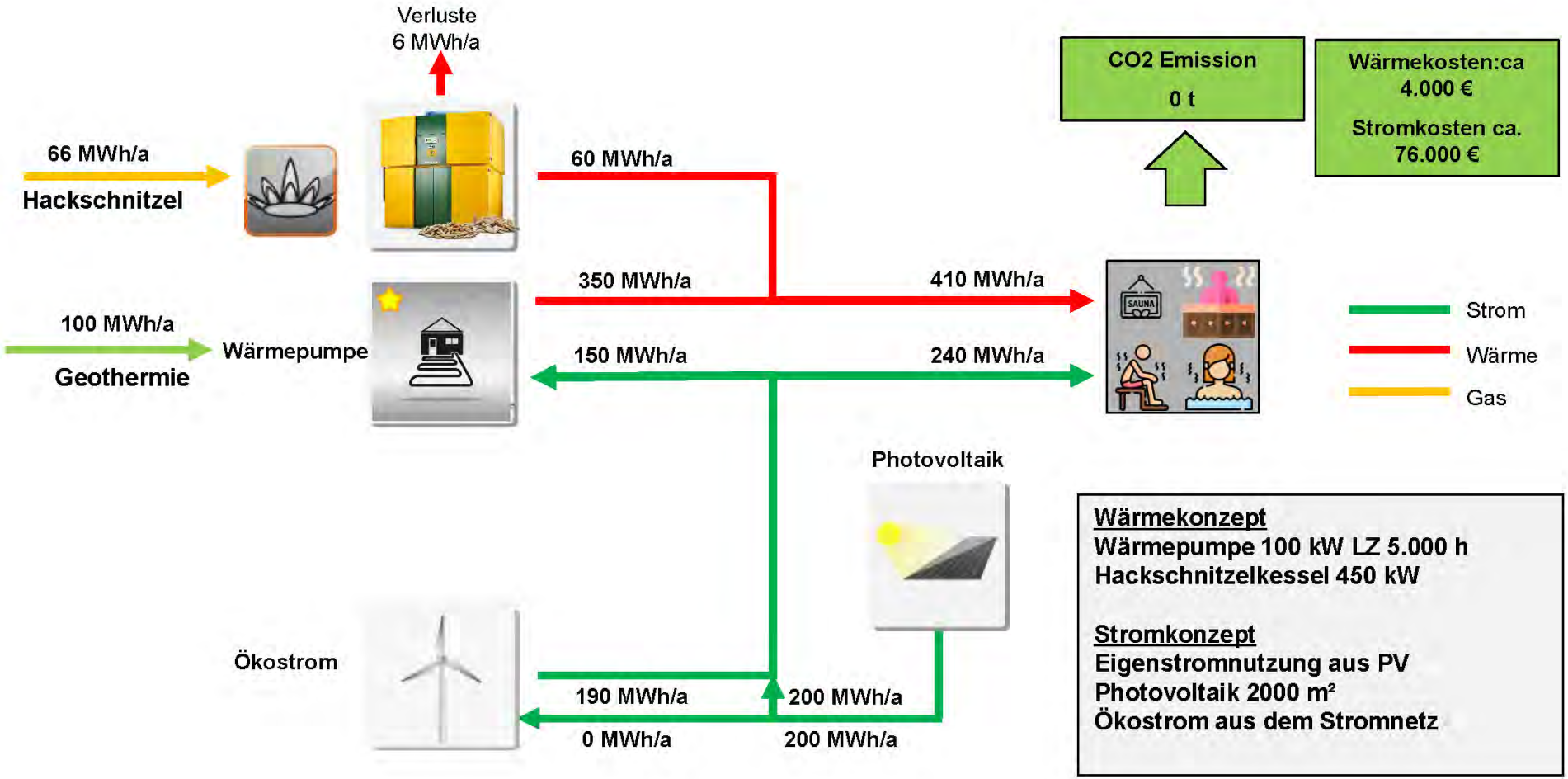
Energiekonzept Saunaanlage

Geothermie + Erdgas- + PV + Ökostrombezug: Klimaneutral



Energiekonzept Saunaanlage

Geothermie + Erdgas- + PV + Ökostrombezug: Klimaneutral



Wärmekonzept
Wärmepumpe 100 kW LZ 5.000 h
Hackschnitzelkessel 450 kW

Stromkonzept
Eigenstromnutzung aus PV
Photovoltaik 2000 m²
Ökostrom aus dem Stromnetz

510 MWh/a Wärme bei einem Gaspreis von 25 Ct/kWh kosten heute: 140.250 €

Das waren vor einem Jahr bei einem Gaspreis von 6 Ct noch 33.600 €

Das heißt die Kosten haben sich mehr als vervierfacht

Reduziert auf 15.000 bzw. 4.000 €

320 MWh/a Strom bei einem Strompreis von 40 Ct/kWh kosten heute 128.000 €

Das waren vor einem Jahr bei einem Strompreis von 25 Ct kWh noch 80.000 €

Das sind ca. 1,5 mal soviel

Reduziert auf 76.000 €

Vielen Dank für ihre Aufmerksamkeit

3.6. Special Guests

3.6.1. Our Excellence the Finish Ambassador

Anne Marjaana Sipiläinen

We like to especially gratitude your highness the finish ambassador Mrs. Anne Sipiläinen who opened the congress with a little aufguss.

Figure 3:Picture @Deutscher Sauna-Bund, from left to right:

3.6.2. Mikkel Aaland

Also, we like to thank Mikkel Aaland who presented and still fights for the honorable project “Sauna Aid”.

Sauna Aid is a multi-country initiative, sponsored by the International Sauna Association (ISA), to provide movable sauna facilities and supportive volunteers to displaced Ukrainians fleeing their war-torn country.

Movable sauna facilities will first be sent to select locations in Poland and Lithuania. Other countries accepting Ukrainian refugees will follow. ISA affiliates in Poland, Czech Republic, Germany, Lithuania, Norway, Denmark, United Kingdom, and Finland are coordinating the movement of the saunas, as well as recruiting and organizing volunteer bath attendants to run and maintain them.

4. Media Data

Figure 4:Welcoming of your excellence the finish abassador Anne Marjaana Sipiläinen by Risto Elomaa

Figure 5:Sauna oven from the main sponsor KLAFS, used for opening ceremony

Figure 6: Congress center in Stuttgart

Figure 7: Opening act the finnish band Uusikuu

Figure 8: Warm welcoming of the president of the Deutsche Sauna-Bund Prof. Dr. Carsten Sonnenberg and Anne Sipiliänen

Figure 9: Congress leader Rolf-Andreas Pieper

Figure 10: Speaker Hans Hägglund

Figure 11: Speaker Don Genders

Figure 12: Speaker Georg Wiesauer

Figure 13: Speaker Markus Gäbele

Figure 14: Speaker Earric Lee

Figure 15: Speaker Hans-Helmut Schaper

Figure 16: Georg Wiesauer

Figure 17: Moderation Jennifer Schönbohm (left), Congress Leader Rolf-A. Pieper (middle) and Speaker Hans Dolman (right)

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Prof. Dr. Carsten Sonnenberg, president | Präsident
Erich Hartmann, vice president | Vizepräsident

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